

# CoRayVac<sup>®</sup>

## Custom-Engineered, Low-Intensity Infrared Heating Systems

### Installation, Operation & Service Manual

CRV-B-2

CRV-B-4

CRV-B-6

CRV-B-8

CRV-B-9

CRV-B-10

CRV-B-12

CRV-B-12A

**FOR YOUR SAFETY**

*If you smell gas:*

1. Open windows.
2. **DO NOT** try to light any appliance.
3. **DO NOT** use electrical switches.
4. **DO NOT** use any telephone in your building.
5. Leave the building.
6. Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.
7. If you cannot reach your gas supplier, call the Fire Department.

**⚠ WARNING**

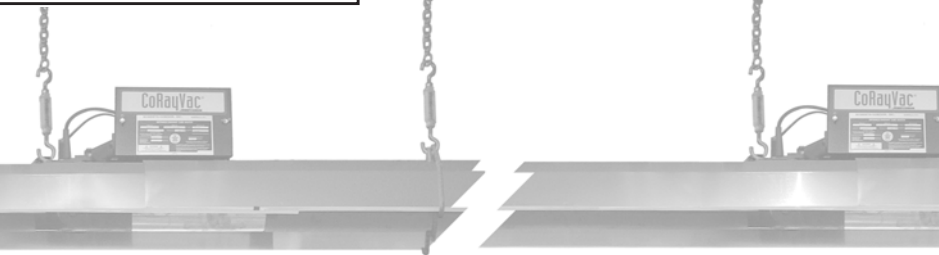


**Fire Hazard**

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.



**⚠ WARNING**

**Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the Installation, Operation and Service Manual thoroughly before installing or servicing this equipment.**

**Installation must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.**

**Installer**

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

**Owner**

Keep this manual in a safe place in order to provide your serviceman with necessary information.



*Quality in Any Language™*

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## TABLE OF CONTENTS

<b>SECTION 1: Heater Safety</b> .....	<b>1</b>	<b>SECTION 12: Control Methods</b> .....	<b>42</b>
1.1 Manpower Requirements .....	1	12.1 ROBERTS GORDON® System Control .....	42
<b>SECTION 2: Installer Responsibility</b> .....	<b>2</b>	12.2 ROBERTS GORDON® ULTRAVAC™ .....	42
2.1 Wall Tag .....	2	12.3 SPST Transformer Relay (P/N 90417600) .....	42
2.2 Corrosive Chemicals.....	2	12.4 DPST Transformer Relay (P/N 90436300).....	42
2.3 National Standards and Applicable Codes .....	2	<b>SECTION 13: Starting The System</b> .....	<b>49</b>
<b>SECTION 3: Critical Considerations</b> .....	<b>3</b>	13.1 Checking the Gas Line .....	49
3.1 Required Clearances to Combustibles.....	3	13.2 Checking the Electrical System .....	49
<b>SECTION 4: National Standards and Applicable Codes</b> .....	<b>7</b>	13.3 Starting the System .....	49
4.1 Gas Codes.....	7	13.4 Setting the Vacuum.....	49
4.2 Aircraft Hangars .....	7	<b>SECTION 14: Operation and Maintenance</b> .....	<b>51</b>
4.3 Public Garages .....	7	14.1 Sequence of Operation.....	51
4.4 Electrical .....	7	14.2 To Shut Off Heater .....	51
4.5 Venting.....	7	14.3 To Start Heater .....	51
4.6 High Altitude .....	7	14.4 Pre-Season Maintenance and Annual Inspection....	51
<b>SECTION 5: Major Components</b> .....	<b>8</b>	14.5 Maintenance Checklist.....	52
5.1 Standard Parts List .....	11	<b>SECTION 15: Troubleshooting</b> .....	<b>55</b>
<b>SECTION 6: Design Requirements</b> .....	<b>13</b>	15.1 Troubleshooting Flow Chart.....	55
<b>SECTION 7: Heater Installation</b> .....	<b>15</b>	<b>SECTION 16: Replacement Parts</b> .....	<b>57</b>
7.1 Tube Installation .....	16	<b>SECTION 17: General Specifications</b> .....	<b>58</b>
7.2 Coupling and Tube Assembly.....	16	17.1 Material Specification .....	58
7.3 Elbow Package Configuration.....	17	17.2 Heater Specifications .....	58
7.4 Reflector Installation .....	18	17.3 Suspension Specifications .....	58
7.5 Burner Installation.....	20	17.4 Controls Specifications.....	58
<b>SECTION 8: Optional Heater Accessories</b> .....	<b>21</b>	<b>SECTION 18: The ROBERTS GORDON® CORAYVAC®</b>	
8.1 Tee Installation .....	21	<b>Limited Warranty</b> .....	<b>61</b>
8.2 Reflector Joint.....	21		
8.3 Reflector Side Extension.....	23		
8.4 Universal Shield.....	24		
8.5 Barrier Shield.....	24		
8.6 Two-Foot Decorative Grille Installation.....	25		
8.7 One-Foot Decorative Grille Installation .....	26		
8.8 Protective Grille Installation.....	29		
8.9 Classic Cast-Iron Components .....	30		
<b>SECTION 9: Pump Installation and Venting</b> .....	<b>31</b>		
9.1 Pump Installation .....	31		
9.2 General Venting Requirements Model EP-100, EP-200 and EP-300 Series Pumps .....	32		
9.3 Horizontal Venting 4" (10 cm) Pipe .....	34		
<b>SECTION 10: Outside Air Supply</b> .....	<b>37</b>		
10.1 Pressurized .....	37		
10.2 Non-Pressurized .....	37		
10.3 Outside Air Blower Internal Wiring .....	38		
<b>SECTION 11: Gas Piping</b> .....	<b>41</b>		

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## TABLE OF FIGURES

Figure 1: Standard Reflector .....	4
Figure 2: One Side Reflector.....	4
Figure 3: Two Side Reflectors .....	4
Figure 4: Universal Shield, Position 1 .....	5
Figure 5: Universal Shield, Position 2 .....	5
Figure 6: Universal Shield, Position 3 .....	5
Figure 7: 2-Foot Deco Grille.....	6
Figure 8: Barrier Shield .....	6
Figure 9: 1-Foot Deco Grille .....	6
Figure 10: Major Component Descriptions.....	8
Figure 11: Heater Assembly Overview .....	14
Figure 12: Critical Hanger Placement .....	15
Figure 13: Reflector Joint Detail .....	22
Figure 14: EP-200 Condensate Valve Assembly.....	31
Figure 15: Vertical Venting Configuration .....	33
Figure 16: EP-100 Horizontal Venting Configurations .....	34
Figure 17: EP-200 Series Horizontal Venting Configurations.....	35
Figure 18: EP-300 Series Horizontal Venting Configurations.....	36
Figure 19: Duct Sizing .....	37
Figure 20: Outside Air Blower Internal Wiring Diagram.....	38
Figure 21: Filter Housing Assembly .....	38
Figure 22: Air Supply Blower Support.....	39
Figure 23: Pressurized Outside Air Supply.....	39
Figure 24: Non-Pressurized Outside Air Supply.....	40
Figure 25: Gas Connection with Flexible Gas Hose.....	41
Figure 26: One Zone Operation without Control Panel .....	43
Figure 27: One Zone Operation (with Outside Air Blower) without Control Panel .....	44
Figure 28: Two Zone Operation without Control Panel.....	45
Figure 29: General System Wiring .....	46
Figure 30: External Wiring Diagram EP-100 and EP-201 120 V 1 Ø Pump .....	46
Figure 31: External Wiring Diagram EP-301 120 V 1 Ø Pump .....	47
Figure 32: External Wiring Diagram EP-203 or EP-303 208 V - 230 V (or 460 V) 3 Ø Pump.....	47
Figure 33: Burner Internal Wiring.....	48
Figure 34: Burner Internal Ladder Diagram .....	48
Figure 35: Vacuum Reading.....	50



## SECTION 1: HEATER SAFETY



Your Safety is Important to Us!  
This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings in these sections.

Installation, service and annual inspection of heater must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Read this manual carefully before installation, operation or service of this equipment.

This heater is designed for heating nonresidential indoor spaces. Do not install in residential spaces. These instructions, the layout drawing, local codes and ordinances, and applicable standards that apply to gas piping, electrical wiring, venting, etc. must be thoroughly understood before proceeding with the installation.

Thin sheet metal parts, the aluminum reflector portion of the heater and the various venting components, have sharp edges. To prevent injury, the use of work gloves is recommended. The use of gloves will also prevent the transfer of body oils from the hands to the surface of the reflector.

Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

### 1.1 Manpower Requirements

To prevent personal injury and damage to the heater, two persons will be required for installation.

## SECTION 2: INSTALLER RESPONSIBILITY

The installer is responsible for the following:

- To ensure the system is designed in accordance with the parameters of the CRV-Series Design Manual (P/N 127500NA).
- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Roberts-Gordon recommends the installer contact a local Building Inspector or Fire Marshal for guidance.
- To use the information given in a layout drawing and in the manual together with the cited codes and regulations to perform the installation.
- To install the heater in accordance with the clearances to combustibles requirements.
- To furnish all needed materials not furnished as standard equipment.
- To plan location of supports.
- To provide access to burners on all sides for servicing or burner removal.
- To provide the owner with a copy of this Installation, Operation and Service Manual.
- To never use heater as a support for ladder or other access equipment and to never hang or suspend anything from heater.
- To ensure there is adequate air circulation around the heater and to supply air for combustion, ventilation and distribution in accordance with local codes.
- To safely and adequately install heater using materials with a minimal working load of 75 lb (33 kg).

### 2.1 Wall Tag


A laminated wall tag is available for the heater as a permanent reminder of the safety instructions and the importance of the required clearances to combustibles. Please contact Roberts-Gordon or your ROBERTS GORDON® independent distributor to obtain the wall tag. Affix the tag by peeling off the backing of the adhesive strips on the rear surface and position the tag on a wall near the CRV-Series heater (e.g. thermostat or controller).

A copy of the wall tag (P/N 91037912) is illustrated on the back cover. For an immediate solution, you may affix this copy on the wall near the heater.

Know your model number and installed configuration. Model number and installed configuration are found on the burner and in the Installation, Operation and

Service Manual. See Page 4, Figure 1 through Page 6, Figure 9. Write the proper clearance dimensions in permanent ink according to your model number and configuration in the open spaces on the tag.

### 2.2 Corrosive Chemicals

 <b>CAUTION</b>
<p><b>Do not use heater in an area containing corrosive chemicals.</b></p>
<p><b>Avoid the use of corrosive chemicals to ensure a longer life of the burner, tubing and other parts.</b></p>
<p><b>Failure to follow these instructions can result in property damage.</b></p>

Roberts-Gordon cannot be responsible for ensuring that all appropriate safety measures are undertaken prior to installation; this is entirely the responsibility of the installer. It is essential that the contractor, the sub-contractor, or the owner identifies the presence of combustible materials, corrosive chemicals or halogenated hydrocarbons\* anywhere in the premises.

\* **Halogenated Hydrocarbons** are a family of chemical compounds characterized by the presence of halogen elements (fluorine, chlorine, bromine, etc.). These compounds are frequently used in refrigerants, cleaning agents, solvents, etc. If these compounds enter the air supply of the burner, the life span of the heater components will be greatly reduced. An outside air supply must be provided to the burners whenever the presence of these compounds is suspected. Warranty will be invalid if the heater is exposed to halogenated hydrocarbons.

### 2.3 National Standards and Applicable Codes

All appliances must be installed in accordance with the latest revision of the applicable standards and national codes. This refers also to the electric, gas and venting installation. Note: Additional standards for installations in public garages, aircraft hangars, etc. may be applicable.



## SECTION 3: CRITICAL CONSIDERATIONS

### 3.1 Required Clearances to Combustibles

Clearances are the required distances that combustible objects must be away from the heater to prevent serious fire hazards. Combustibles are materials that may catch fire and include common items such as wood, paper, rubber, fabric, etc.

#### **Maintain clearances to combustibles at all times for safety.**

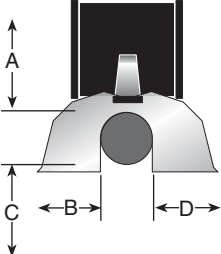
Clearances for all heater models are located on the burner of the heater and on *Page 4, Figure 1 through Page 6, Figure 9* in this manual. Check the clearances on each burner for the model heater being installed to make sure the product is suitable for your application and the clearances are maintained. Read and follow the safety guidelines below:

- Keep gasoline or other combustible materials including flammable objects, liquids, dust or vapors away from this heater or any other appliance.
- Maintain clearances from heat sensitive material, equipment and workstations.
- Maintain clearances from vehicles parked below the heater.
- Maintain clearances from swinging and overhead doors, overhead cranes, vehicle lifts, partitions, storage racks, hoists, building construction, etc.
- In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain required clearances from the heater to the combustibles. Signs must be posted adjacent to the heater thermostat. In the absence of a thermostat, signs must be posted in a conspicuous location.
- Consult local Fire Marshal, Fire Insurance Carrier or other authorities for approval of proposed installation when there is a possibility of exposure to combustible airborne materials or vapors.
- Hang heater in accordance to the minimum suspension requirements on *Page 15, Figure 12*.
- If the radiant tubes must pass through the building structure, be sure that adequate sleeving and fire stop is installed to prevent scorching and/or fire hazard.

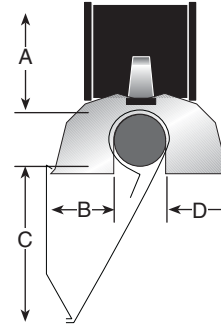


- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, elbows, tees and crosses.
  2. Clearances B, C and D can be reduced by 50% after 25' (7.5 m) of tubing downstream from where the combustion chamber and the tube connect.
- \* Protective Grille clearances are the same as Standard Reflector.

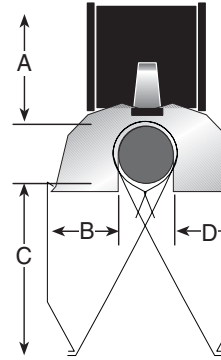
**FIGURE 1: STANDARD REFLECTOR**

	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	20	48	20	11	51	122	51
	CRV-B-4	4	20	48	20	11	51	122	51
	CRV-B-6	4	20	48	20	11	51	122	51
	CRV-B-8	4	20	48	20	11	51	122	51
	CRV-B-9	4	36	60	36	11	92	153	92
	CRV-B-10	4	36	60	36	11	92	153	92
	CRV-B-12	4	36	60	36	11	92	153	92
	CRV-B-12A	4	36	60	36	11	92	153	92

**FIGURE 2: ONE SIDE REFLECTOR**

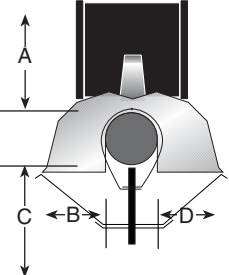
	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	56	20	11	31	143	51
	CRV-B-4	4	12	56	20	11	31	143	51
	CRV-B-6	4	12	56	20	11	31	143	51
	CRV-B-8	4	12	56	20	11	31	143	51
	CRV-B-9	4	12	60	42	11	31	153	107
	CRV-B-10	4	12	60	42	11	31	153	107
	CRV-B-12	4	12	60	42	11	31	153	107
	CRV-B-12A	4	12	60	42	11	31	153	107

**FIGURE 3: TWO SIDE REFLECTORS**

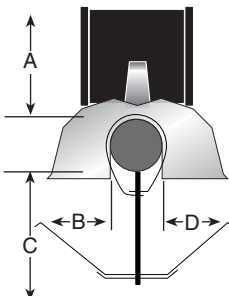
	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	56	12	11	31	143	31
	CRV-B-4	4	12	56	12	11	31	143	31
	CRV-B-6	4	12	56	12	11	31	143	31
	CRV-B-8	4	12	56	12	11	31	143	31
	CRV-B-9	4	12	60	12	11	31	153	31
	CRV-B-10	4	12	60	12	11	31	153	31
	CRV-B-12	4	12	60	12	11	31	153	31
	CRV-B-12A	4	12	60	12	11	31	153	31

- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, elbows, tees and crosses.
  2. Clearances B, C and D can be reduced by 50% after 25' (7.5 m) of tubing downstream from where the combustion chamber and the tube connect.

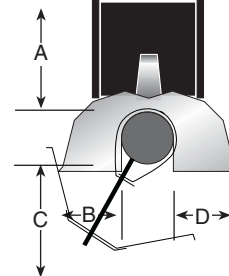
**FIGURE 4: UNIVERSAL SHIELD, POSITION 1**

	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	12	12	11	31	31	31
	CRV-B-4	4	12	12	12	11	31	31	31
	CRV-B-6	4	12	12	12	11	31	31	31
	CRV-B-8	4	12	12	12	11	31	31	31
	CRV-B-9	8	18	24	18	21	46	61	46
	CRV-B-10	8	18	24	18	21	46	61	46
	CRV-B-12	8	18	24	18	21	46	61	46
	CRV-B-12A	8	18	24	18	21	46	61	46

**FIGURE 5: UNIVERSAL SHIELD, POSITION 2**

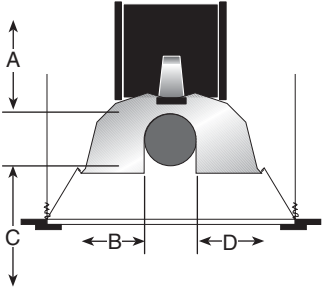
	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	24	48	24	11	61	122	61
	CRV-B-4	4	24	48	24	11	61	122	61
	CRV-B-6	4	24	48	24	11	61	122	61
	CRV-B-8	4	24	48	24	11	61	122	61
	CRV-B-9	4	36	48	36	11	92	122	92
	CRV-B-10	4	36	48	36	11	92	122	92
	CRV-B-12	4	36	48	36	11	92	122	92
	CRV-B-12A	4	36	48	36	11	92	122	92

**FIGURE 6: UNIVERSAL SHIELD, POSITION 3**

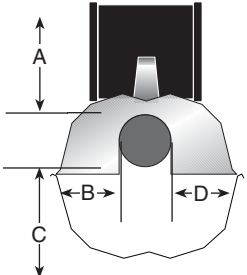
	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	56	30	11	31	143	77
	CRV-B-4	4	12	56	30	11	31	143	77
	CRV-B-6	4	12	56	30	11	31	143	77
	CRV-B-8	4	12	56	30	11	31	143	77
	CRV-B-9	8	12	60	42	21	31	153	107
	CRV-B-10	8	12	60	42	21	31	153	107
	CRV-B-12	8	12	60	42	21	31	153	107
	CRV-B-12A	8	12	60	42	21	31	153	107

- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, elbows, tees and crosses.
  2. Clearances B, C and D can be reduced by 50% after 25' (7.5 m) of tubing downstream from where the combustion chamber and the tube connect.

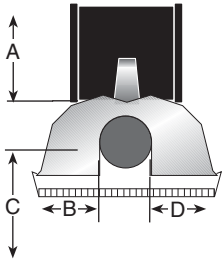
**FIGURE 7: 2-FOOT DECO GRILLE**

	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	48	12	11	31	122	31
	CRV-B-4	4	12	48	12	11	31	122	31
	CRV-B-6	4	12	48	12	11	31	122	31
	CRV-B-8	4	12	48	12	11	31	122	31
	CRV-B-9	4	18	56	18	11	46	143	46
	CRV-B-10	4	18	56	18	11	46	143	46
	CRV-B-12	4	18	56	18	11	46	143	46
	CRV-B-12A	4	18	56	18	11	46	143	46

**FIGURE 8: BARRIER SHIELD**

	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	12	12	11	31	31	31
	CRV-B-4	4	12	12	12	11	31	31	31
	CRV-B-6	4	12	12	12	11	31	31	31
	CRV-B-8	4	12	12	12	11	31	31	31
	CRV-B-9	- UNAPPROVED -				- UNAPPROVED -			
	CRV-B-10	- UNAPPROVED -				- UNAPPROVED -			
	CRV-B-12	- UNAPPROVED -				- UNAPPROVED -			
	CRV-B-12A	- UNAPPROVED -				- UNAPPROVED -			

**FIGURE 9: 1-FOOT DECO GRILLE**

	Model	(inches)				(centimeters)			
		A	B	C	D	A	B	C	D
	CRV-B-2	4	12	48	12	11	51	122	51
	CRV-B-4	4	12	48	12	11	51	122	51
	CRV-B-6	4	12	48	12	11	51	122	51
	CRV-B-8	4	12	48	12	11	51	122	51
	CRV-B-9	4	18	56	18	11	92	153	92
	CRV-B-10	4	18	56	18	11	92	153	92
	CRV-B-12	4	18	56	18	11	92	153	92
	CRV-B-12A	4	18	56	18	11	92	153	92

## SECTION 4: NATIONAL STANDARDS AND APPLICABLE CODES

### 4.1 Gas Codes

The type of gas appearing on the nameplate must be the type of gas used. Installation must comply with national and local codes and requirements of the local gas company.

United States: Refer to National Fuel Gas Code, ANSI Z223.1 - latest revision (same as NFPA 54).

Canada: Refer to CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

### 4.2 Aircraft Hangars

Installation in aircraft hangars must be in accordance with the following codes:

United States: Refer to Standard for Aircraft Hangars, ANSI/NFPA-409 - latest revision.

Canada: Refer to Standard CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

- In aircraft storage and servicing areas, heaters shall be installed at least 10' (3 m) above the upper surface of wings or of engine enclosures of the highest aircraft which may be housed in the hangar. The measurement shall be made from the wing or engine enclosure (whichever is higher from the floor) to the bottom of the heater.
- In shops, offices and other sections of aircraft hangars communicating with aircraft storage or servicing areas, heaters shall be installed not less than 8' (2.4 m) above the floor.
- Suspended or elevated heaters shall be so located in all spaces of aircraft hangars that they shall not be subject to injury by aircraft, cranes, movable scaffolding or other objects. Provisions shall be made to assure accessibility to suspended heaters for recurrent maintenance purposes.

### 4.3 Public Garages

Installation in garages must be in accordance with the following codes:

United States: Standard for Parking Structures NFPA-88A - latest revision or the Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A - latest revision. Canada: Refer to CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

- Heaters must not be installed less than 8' (2.4 m) above the floor. Minimum clearances to combustibles must be maintained from vehicles parked below the heater.
- When installed over hoists, minimum clearances to combustibles must be maintained from the uppermost point of objects on the hoist.

### 4.4 Electrical

The heater must be electrically grounded in accordance with the following codes:

United States: Refer to National Electrical Code®, ANSI/NFPA-70 - latest revision. Wiring must conform to the most current National Electrical Code®, local ordinances and any special diagrams furnished.

Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

### 4.5 Venting

The venting must be installed in accordance with the requirements within this manual and the following codes:

United States: Refer to NFPA-54/ANSI Z223.1 - latest revision, National Fuel Gas Code.

Canada: Refer to CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

### 4.6 High Altitude

These heaters are approved for installations up to 2000' (610 m) (US), 4500' (1370 m) (Canada) without modification. Consult factory if US installation is above 2000' (610 m) or Canadian installation is above 4500' (1370 m).

**SECTION 5: MAJOR COMPONENTS**

The figures in this section provide a general overview of component placement in a CRV-Series system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown on Page 14, Figure 11.

Optional reflector configurations are shown on Page 4, Figure 1 through Page 6, Figure 9. Install appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch.

**FIGURE 10: Major Component Descriptions**

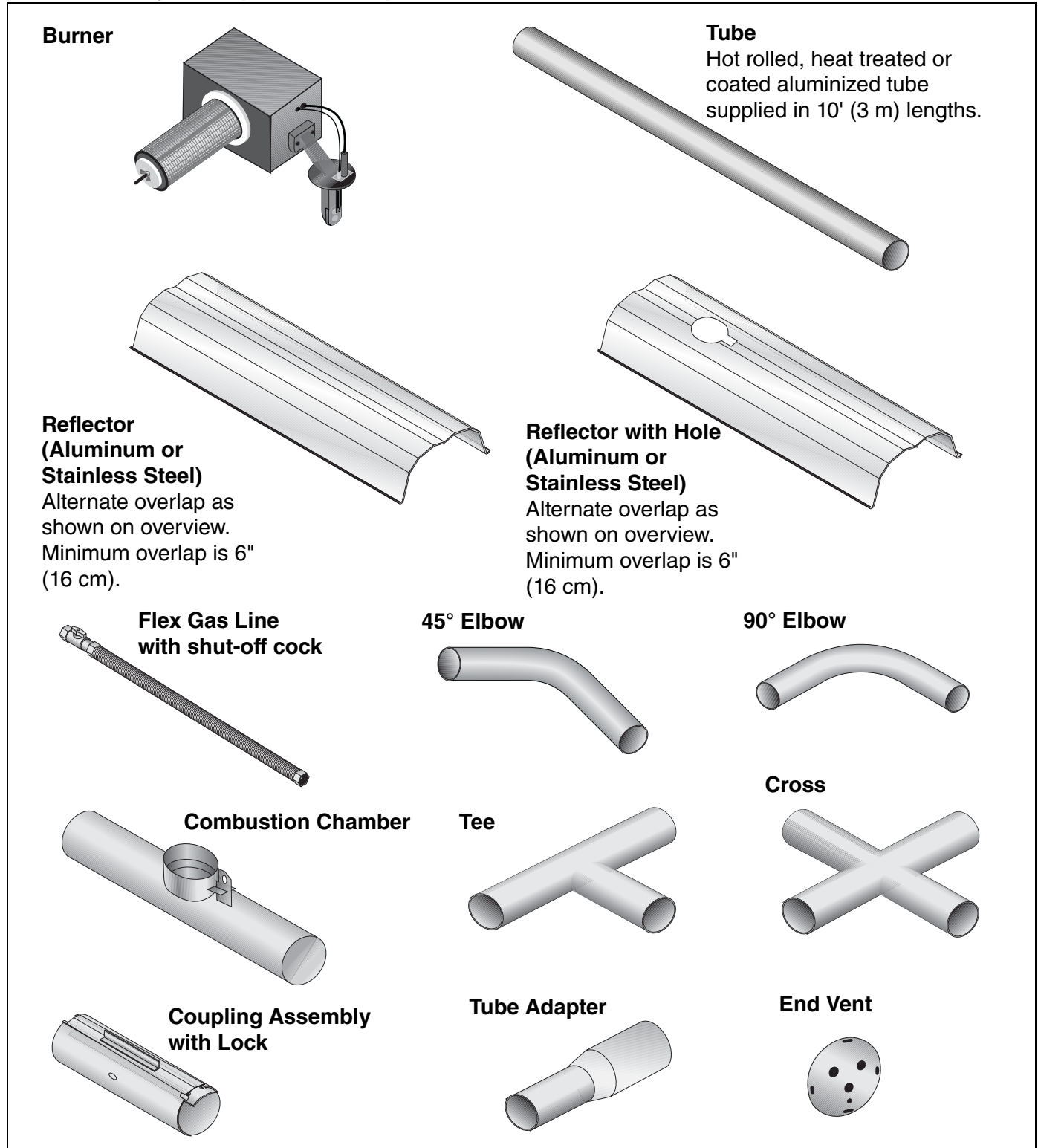
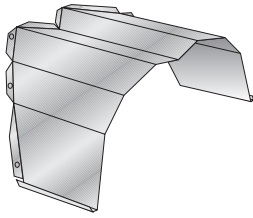
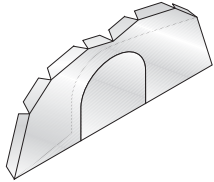


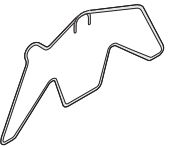
FIGURE 10: Major Component Descriptions (Continued)

**Reflector Joint****Reflector End Cap  
(Aluminum or Stainless Steel)**

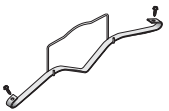
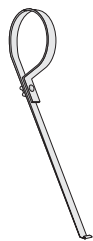
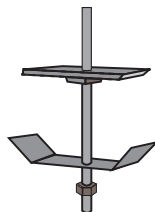
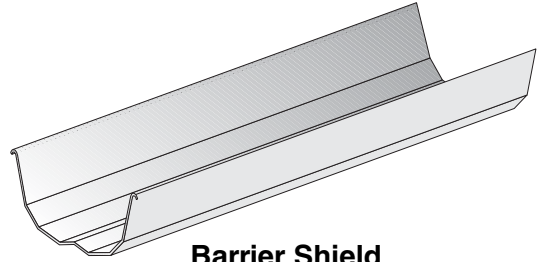
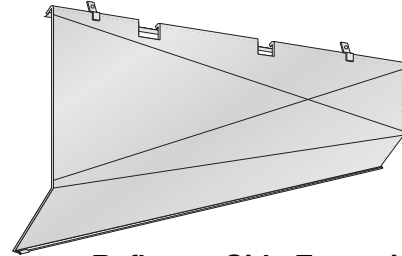
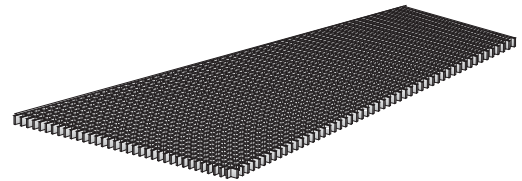
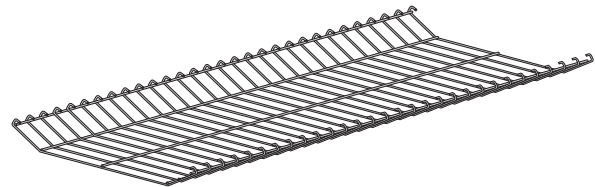
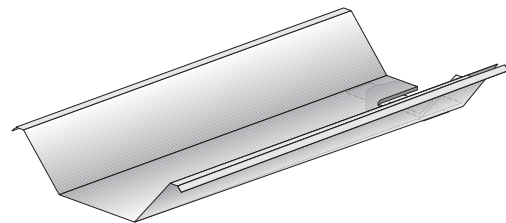
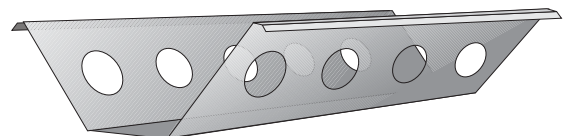
Punch out center section to accommodate heat exchanger tube when necessary.

**Tube and Reflector Hanger  
with Clamp Package**

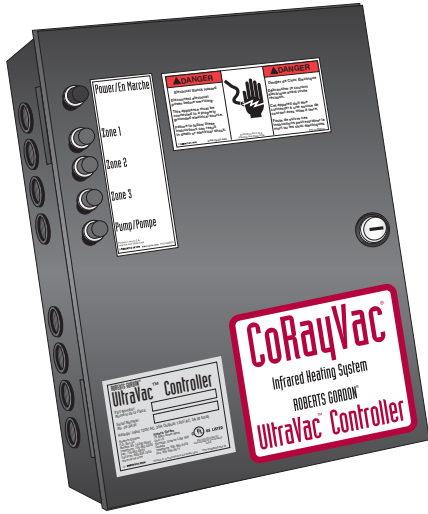
Position this hanger no more than 4" (10 cm) away from the burner.

**Tube and Reflector Hanger**

Suspend system from these hangers.

**Reflector Support Strap &  
Wire Form****S-Hook****Turnbuckle****Reflector Side  
Extension Bracket****Condensate  
Valve  
Assembly****Bracket Assembly****Barrier Shield****Reflector Side Extension****Deco Grille****Protective Grille****Universal Shield****Universal Shield with Holes**

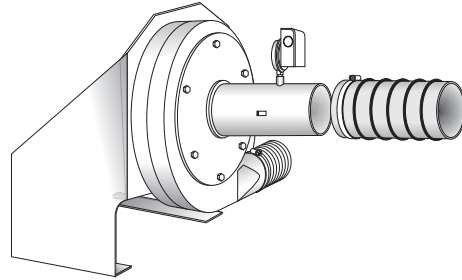
**FIGURE 10: Major Component Descriptions (Continued)**



**ROBERTS GORDON®  
ULTRAVAC™ Controller**



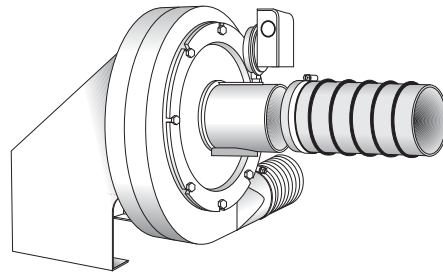
**ROBERTS GORDON®  
ULTRAVAC™  
Variable Frequency Drive**



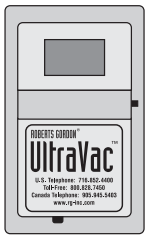
**EP-100 Pump Package - 4" dia  
For more information, refer to the EP-100  
Installation, Operation and Service  
Manual (P/N 127201NA).**



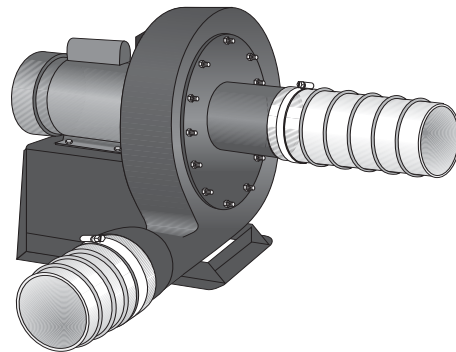
**System Control**



**EP-201 Pump Package - 4" dia  
EP-203 Pump Package - 4" dia  
For more information, refer to the EP-200  
Series Installation, Operation and Service  
Manual (P/N 127200NA).**



**ROBERTS GORDON®  
ULTRAVAC™  
Adjustable Indoor Sensor**



**EP-301 Pump Package - 4" dia  
EP-301 Pump Package - 6" dia  
EP-303 Pump Package - 4" dia  
EP-303 Pump Package - 6" dia  
For more information, refer to the  
EP-300 Series Installation, Operation  
and Service Manual (P/N 127202NA).**



## 5.1 Standard Parts List

**Table 1: Contents of CRV-Series Burner Carton**

Part No.	Description
0270XXXX	Burner (Rate and Fuel Varies)
*91412200	Flexible Stainless Steel Gas Hose, 1/2" NPT (US models only)
013676XX	End Vent Plate
01397300	Accessory Package
01361200	Filter Support Disk
01367800	Combustion Chamber Gasket
02724901	Door Assembly w/ Hole
91115100	Screw #10 - 24 x 5/8
91119500	U-Clip
91905500	Filter Support
92123900	Nut 5/16 - 18
92511601	Wing Nut #10 - 24
96411600	Lock Washer 5/16"
01312401	Filter and Gasket

\* Canadian Models: Rubber (Type 1) Gas Hoses available as an accessory, see *Page 41*.

**Table 2: Common CRV-Series Components**

Part No.	Description
Combustion Chamber:	
02722300-1P	Hot Rolled Steel Combustion Chamber
02722301-1P	Heat-Treated Aluminized Steel Combustion Chamber
0272230D-1P	Porcelain Coated Steel Combustion Chamber
02721200-1P	Cast Iron Combustion Chamber
<b>Tubing and Related Accessories</b>	
01312700	Coupling, 4" (10 cm) Plain
01312706	Coupling, 6" (15 cm) Plain
0131270I	Coupling, 4" (10 cm) Lined
01331900	Coupling, 4" (10 cm) Damper
E0009356	Coupling, 6" (15 cm) Damper
0133022D	Tee, 4" (10 cm) Coated
01330203	Tee, 4" (10 cm) Aluminized
01330204	Tee, 6" (15 cm) Aluminized
0133092D	Cross, 4" (10 cm) Coated
01330903	Cross, 4" (10 cm) Aluminized
01330904	Cross, 6" (15 cm) Aluminized
01335801	Elbow, 4" (10 cm) Aluminized 90°
T0100320	Elbow, 6" (15 cm) Aluminized 90°
0133580D	Elbow, 4" (10 cm) Coated 90°
01336101	Elbow, 4" (10 cm) Aluminized 45°
0133610D	Elbow, 4" (10 cm) Coated 45°
91409300	Tube, Hot Rolled Steel 4" (10 cm) dia 10' (3 m)
91409403	Tube, Non-Heat Treated Aluminized 4" (10 cm) dia 10' (3 m)
91409408	Tube, Heat Treated Aluminized 4" (10 cm) dia 10' (3 m)
91409420	Tube, Non-Heat Treated Aluminized 6" (15 cm) dia 10' (3 m)
9141030D	Tube, Coated 4" (10 cm) dia 10' (3 m)
E0009105	Tube, Heat Treated Aluminized 6" (15 cm) dia 10' (3 m)
91418200	Tube Adapter, Aluminized 6" (15 cm) dia x 4" (10 cm) dia

02722100	Adapter, 4" (10 cm) Cast Iron
91240010	Tube Hanger, 6" (15 cm)
91308001	High Temperature Pipe Compound, 1lb. can
<b>Venting Accessories</b>	
01324401	Outside Air Supply Takeoff, 4" (10 cm)
01326801	Outside Air Filter Housing
90707501	Air Supply Blower/Power Venter
91409601	Outside Air Flex Duct, 4" (10 cm) (Box of 8 - 8' [2.4 m] sections)
<b>Reflectors and Related Accessories</b>	
01329910	Reflector Side Extension Support
03050010	Reflector Support Package (Tubing)
02712700	Reflector Side Extension, 2 Clips, 2 Screws
02716400	Reflector Support Package (Schedule 40 Pipe)
02750303	Reflector, Aluminum
027503SS	Reflector, Stainless Steel
02750304	Reflector, Aluminum with Hole
027503SH	Reflector, Stainless Steel with Hole
02750800	Reflector End Cap, Aluminum
027508SS	Reflector End Cap, Stainless Steel
027508SH	Reflector End Cap, Stainless Steel with Hole
02750900	Reflector Joint
027509SS	Reflector Joint, Stainless Steel
027127SS	Reflector Side Extension, Stainless Steel
03090100	Tube and Reflector Hanger
02790300	Tube and Reflector Hanger, Cast Iron
91907302	S-Hook
91903201	Turnbuckle
91903300	Spring Hook
91903202	Turnbuckle with Eyebolt
02712100	Universal Shield Support
02751800	Universal Shield with Holes
02751801	Universal Shield
027518SS	Universal Shield, Stainless Steel

<b>Control Packages and Accessories</b>	
10001501	Water Resistant Sensor
02770002	System Control
URVCCM	ROBERTS GORDON® ULTRAVAC™ Central Controller (with Modem Chip & Software) Includes:
URVSC	ROBERTS GORDON® ULTRAVAC™ Controller
10080142	Modem Chip
10081501	Outdoor Sensor
10080410	PC Connection Cable Package
URVCCR	ROBERTS GORDON® ULTRAVAC™ Central Controller (with RS-485 Converter & Software) Includes:
URVSC	ROBERTS GORDON® ULTRAVAC™ Controller
10080430	RS-485 Converter with 9 V Power Supply
10081501	Outdoor Sensor
10080410	PC Connection Cable Package
URVCCL	ROBERTS GORDON® ULTRAVAC™ Central Controller (with TCP/IP Communication Module & Software) Includes:
URVSC	ROBERTS GORDON® ULTRAVAC™ Controller
10080440	TCP/IP Communication Module
10081501	Outdoor Sensor
10080410	PC Connection Cable Package
URVSC	Controller, ROBERTS GORDON® ULTRAVAC™ , 1 Pump 3 Zones (Satellite Control)
VFD75115	Variable Frequency Drive Assembly, 75 HP, 115 V Input
VFD75230	Variable Frequency Drive Assembly, 75 HP, 230 V Input
VFD20230	Variable Frequency Drive Assembly, 2 HP, 230 V Input
10080142	Modem, Plug-In Chip
10080410	Cable Package, PC Connection
10080430	RS-485 Converter with 9V Power Supply
10080440	TCP/IP Communication Module
10081500	Sensor, Adjustable Indoor, Deg F, ROBERTS GORDON® ULTRAVAC™ Controller
10081501	Sensor, Outdoor, ULTRAVAC™
10081502	Sensor, Adjustable Indoor, Deg C, ULTRAVAC™

<b>Thermostats</b>	
05023000	Load Relay Package
90417600	Transformer Relay - SPST (12 A)
90436300	Transformer Relay - DPST (12 A)
90423000	24 V Low Voltage Thermostat (Marked 1-5)
90424300	Thermostat Guard

<b>Deco Grille (1' x 8' [.3 m x 2.4 m])</b>	
01363003	Bracket
01365901	End Piece
01326801	Reinforcement
01365903	Joint Piece
91406700	1' (.3 m) x 8' (2.4 m) Protective Grille

<b>Deco Grille (2' x 4' [.6 m x 1.2 m])</b>	
01365900	Shield Frame
01370408	Reflector Side Extension 8" x 48" (20.3 cm x 122 cm)
01370412	Reflector Side Extension 12" x 48" (30.5 cm x 122 cm)
01370416	Reflector Side Extension 16" x 48" (40.6 cm 122 cm)
91407000	Grille, Aluminum 2' x 4' (.6 m x 1.2 m)

<b>Protective Grille</b>	
08050001	Protective Grille, 40" (1 m)
08050002	Protective Grille End Cap

<b>Shields</b>	
02750303	Barrier Shield
02751801	Universal Shield
027518SS	Universal Shield, Stainless Steel
02751800	Universal Shield with Holes

<b>Pump Packages and Accessories</b>	
<b>02719105</b>	EP-100 Pump Package
02719100	EP-100 Pump
02724700	Accessory Package
<b>02716305</b>	EP-201 Pump Package
01312001	EP-201 Pump
01317805	Accessory Package
<b>02712034</b>	EP-203 Pump Package
01312002	EP-203 Pump
01317805	Accessory Package
<b>02723014</b>	EP-301 Pump Package 4"
02730101	EP-301 Pump Assembly
02730104	Accessory Package
<b>02723016</b>	EP-301 Pump Package 6"
02730101	EP-301 Pump Assembly
02730106	Accessory Package
<b>02723034</b>	EP-303 Pump Package 4"
02730103	EP-303 Pump Assembly
02730104	Accessory Package
<b>02723036</b>	EP-303 Pump Package 6"
02730103	EP-303 Pump Assembly
02730106	Accessory Package

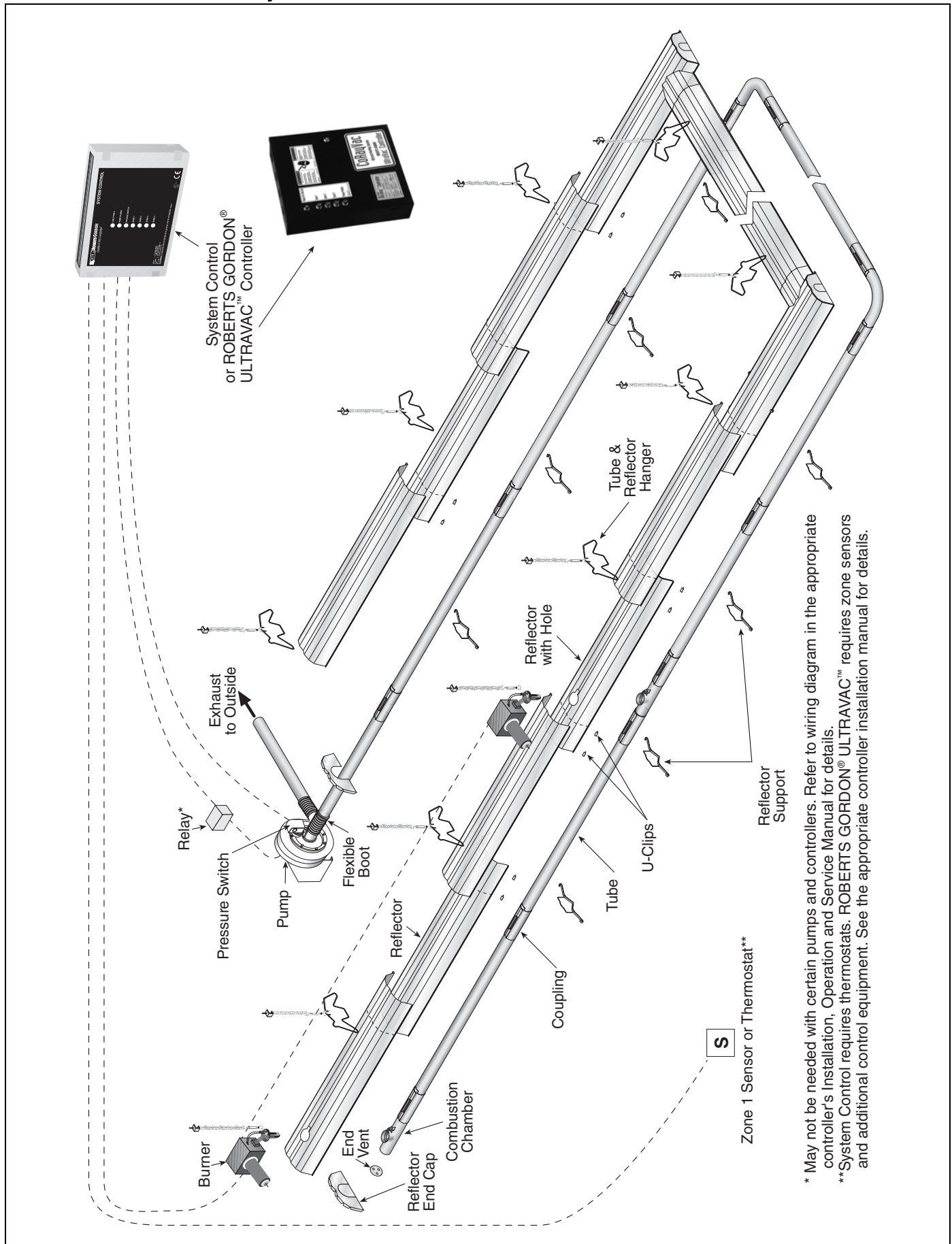
<b>Pump Accessories</b>	
90430600K	Pressure Switch
01327001	Condensate Check Valve Assembly
02718851	Drain Cap, 4" (10 cm)
02718852	Drain Cap, 6" (15 cm)

<b>Starters</b>	
10050001	Starter, 120 Vac for EP-203, 3 Ø
10050002	Starter, 12 Vdc for EP-201, 1Ø
10050003	Starter, 120 Vac for EP-201, 1 Ø
10050008	Starter, 120 Vac for EP-301, 1 Ø
10050009	Contact Package-230 Vac Coil for EP-301, 2 HP
10050010	Starter, 120 Vac for EP-303, 3 Ø

**SECTION 6: DESIGN REQUIREMENTS**

The CRV-Series system's design is related to the system operation and performance required by the building being heated. Every effort should be made to follow the dimensions on the layout drawing. If deviations are necessary, either contact the company responsible for the layout design, your ROBERTS GORDON® independent distributor, or consult the CRV-Series Design Manual (P/N 127500NA).

FIGURE 11: Heater Assembly Overview




\* May not be needed with certain pumps and controllers. Refer to wiring diagram in the appropriate controller's Installation, Operation and Service Manual for details.  
 \*\*System Control requires thermostats. ROBERTS GORDON® ULTRAVAC™ requires zone sensors and additional control equipment. See the appropriate controller installation manual for details.

## SECTION 7: HEATER INSTALLATION

⚠

## WARNING



**Suspension Hazard**

Hang heater with materials with a minimum working load of 75 lbs (33 kg).

Failure of the supports can result in death, injury or property damage.

To ensure your safety and comply with the terms of the warranty, all units must be installed in accordance with these instructions.

The gas or the electrical supply lines must not be used to support the heater.

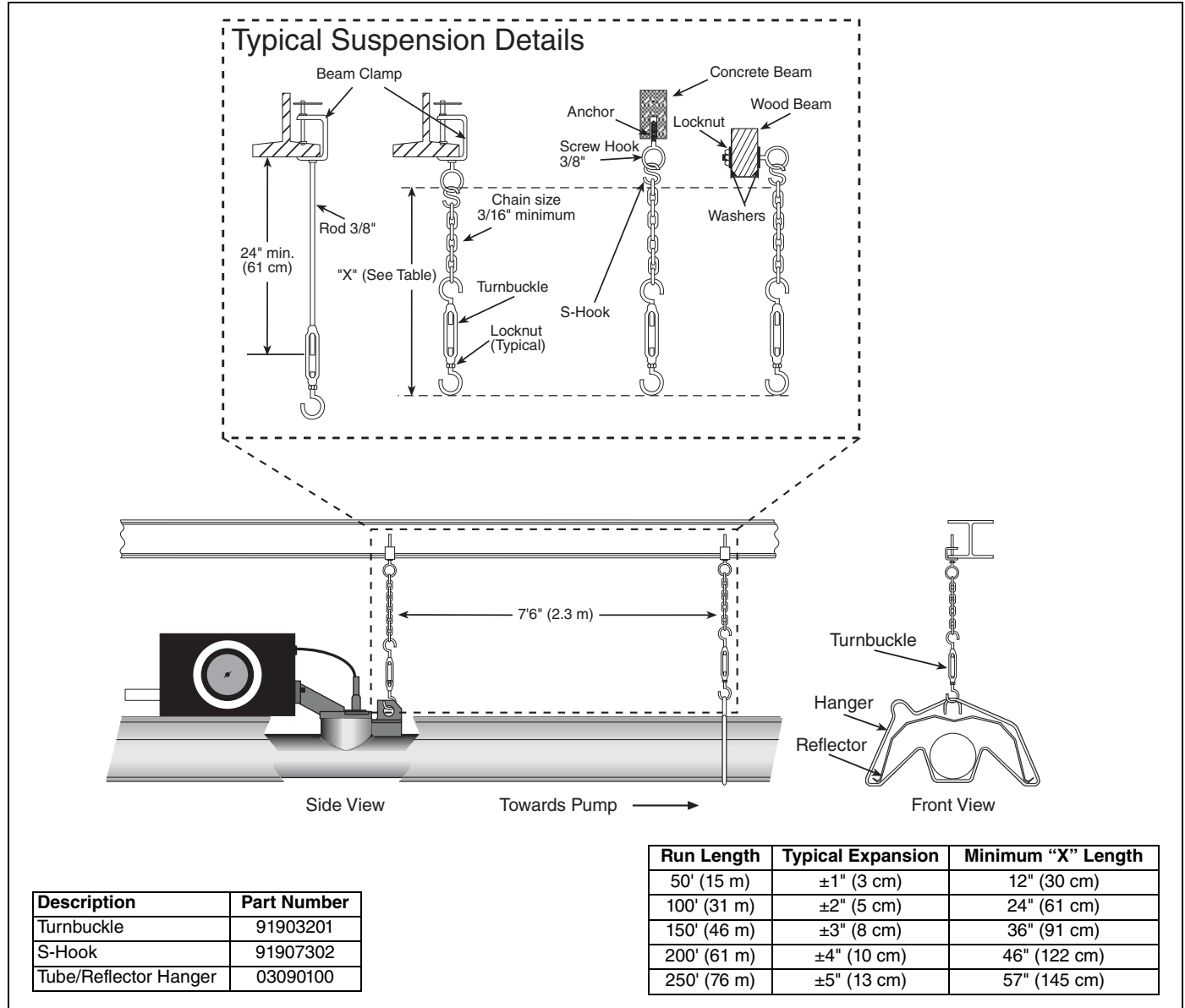
Do not locate the gas or electric supply lines directly over the path of the flue products from the heater. The heater must be installed in a location that is readily accessible for servicing.

The heaters must be installed in accordance with clearances to combustibles as indicated on the rating plate and in this instruction manual.

The minimum and maximum gas inlet pressures must be maintained as indicated on the rating plate. Typical installation configurations are shown in *Figure 12*.

Expansion and contraction of the tube dictates that the minimum suspension lengths in the table on *Figure 12* be maintained.

**FIGURE 12: Critical Hanger Placement**



### Step 7.1 Tube Installation

**NOTE:** Tubing requires a downward slope of 1/2" (13 mm) per 20' (6 m) away from burner. Tailpipe tubing requires a downward slope of 1" (26 mm) per 20' (6 m) away from burner.

Description	Part Number
Tube	91409XXX
Turnbuckle	91903201
Tube/Reflector Hanger	03090100

### Step 7.2 Coupling and Tube Assembly

**A** Close coupling with tab.

**B** Start slide bar/coupling lock onto coupling.

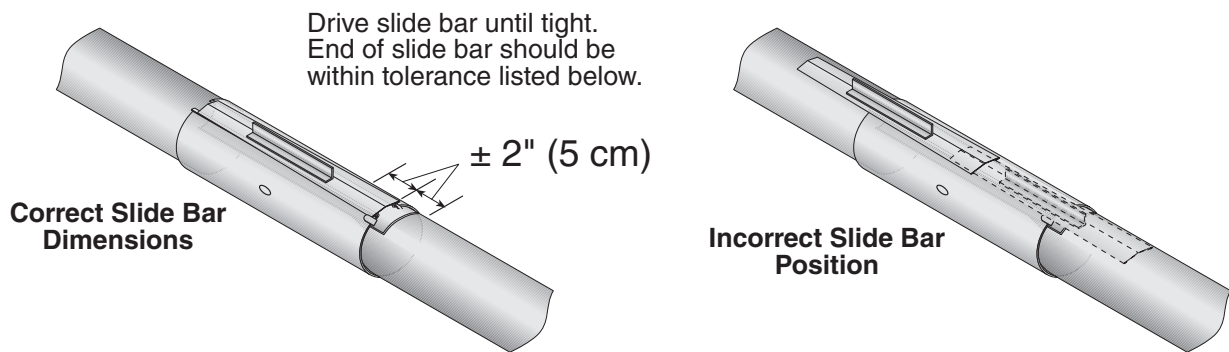
**C** Insert tubes into coupling.

**D** Tighten coupling to join tubes.

Description	Part Number
Coupling	01329600
Slide Bar/Coupling Lock	01329700
Tube	91409XXX

### Step 7.2.1 Coupling and Tube Assembly (Continued)

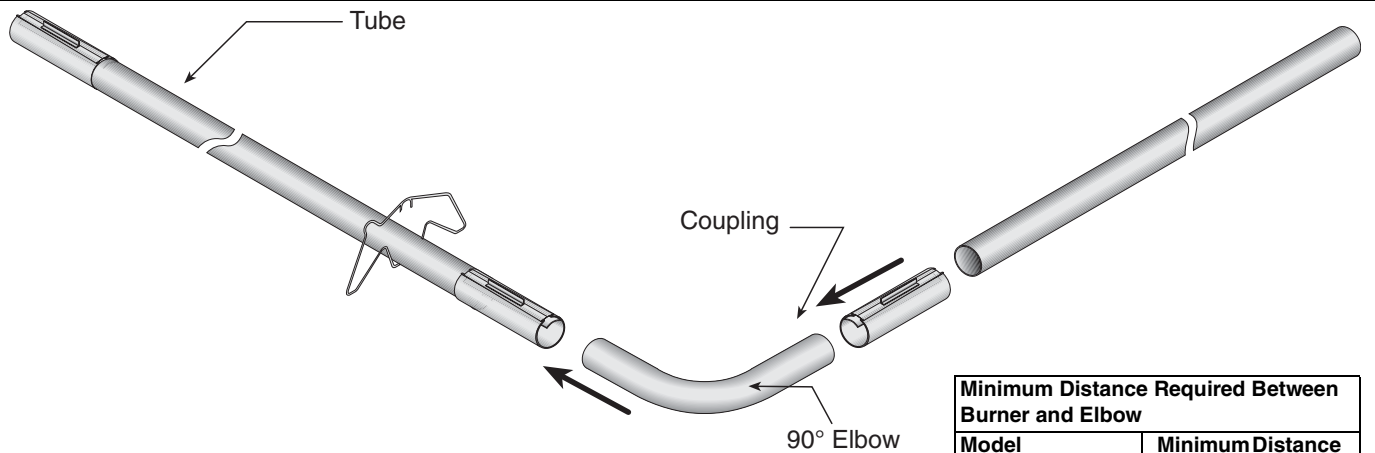
Tighten slide bar as shown below.



Repeat Step 7.2, A - D until all tubes are assembled.  
**NOTE:** If coupling is not tight, loss of vacuum can occur.

### 7.3 Elbow Package Configuration

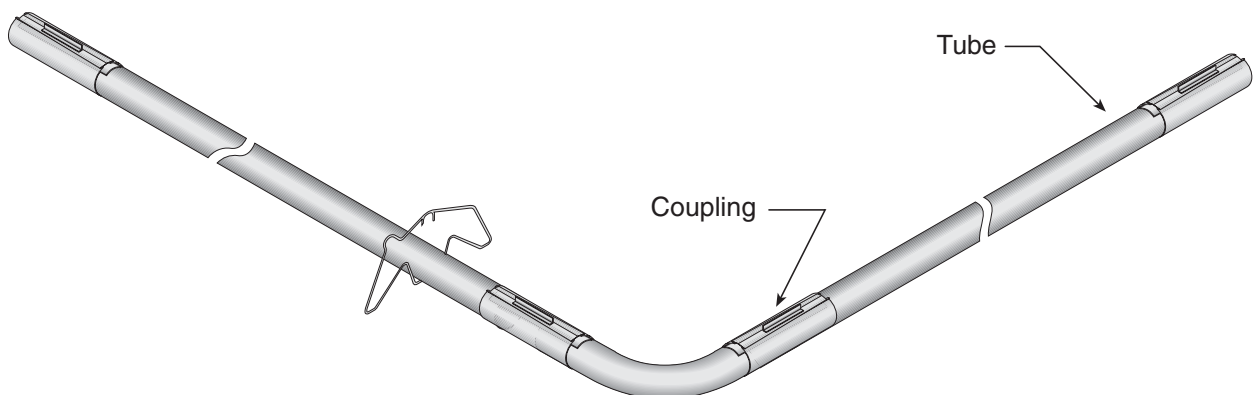
#### Step 7.3.1 Elbow Installation



Description	Part Number
<b>Elbow Package</b>	<b>02718702</b>
90° Elbow	01335801
Coupling	01312700
Reflector End Cap	02750800
Reflector Joint Piece	02750900
U-Clip Package	91107720

Minimum Distance Required Between Burner and Elbow	
Model	Minimum Distance
CRVB-2	5' (1.5 m)
CRVB-4	5' (1.5 m)
CRVB-6	10' (3 m)
CRVB-8	10' (3 m)
CRVB-9	10' (3 m)
CRVB-10	15' (4.5 m)
CRVB-12A	15' (4.5 m)
CRVB-12	15' (4.5 m)

#### Step 7.3.2 Elbow Installation



### Step 7.4 Reflector Installation

#### Step 7.4.1 Reflector Installation with Hole

Slide Reflector with hole through hanger. Unhook combustion chamber from chain and insert through hole. Reconnect chain.

Reflector with Hole

Hanger

Tube

Combustion Chamber

Description	Part Number
Tube/Reflector Hanger	03090100
Tube	91409XXX
Reflector with Hole	02750304

#### Step 7.4.2 Reflector Installation

Wire Form

Reflector

Sheet Metal Screw

Reflector Support Strap

Tube

U-Clip (2 Clips per Alternate Overlaps per Side)

Description	Part Number
Reflector Support Package	03050010
U-Clip Package	91107720
Reflector End Cap	027508XX



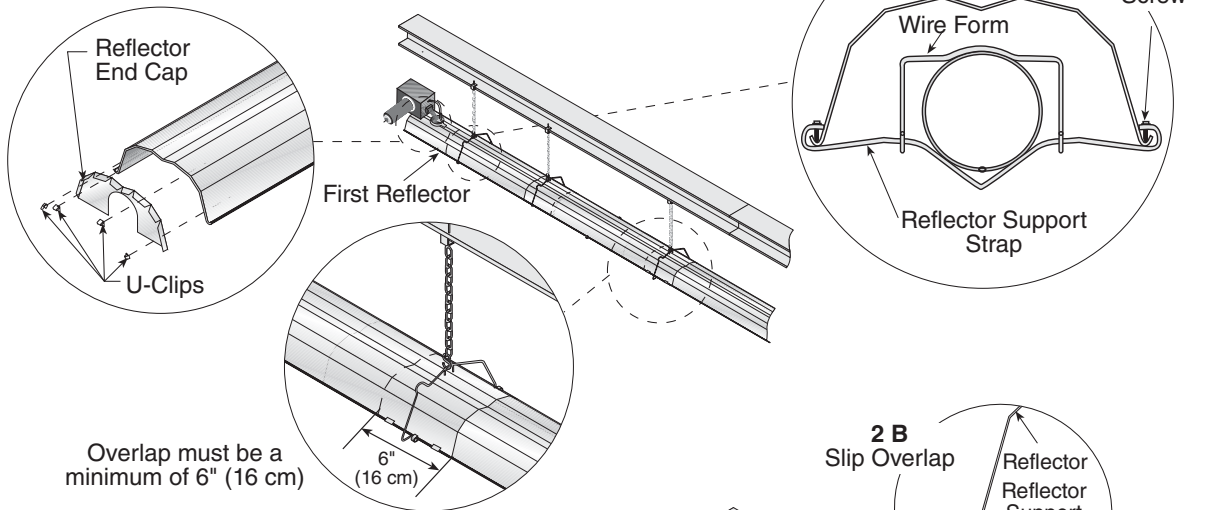
### Step 7.4.3 Reflector, U-Clip and Reflector Support Installation

The pictorial drawings of the heater construction in *Section 7* are schematic only and provide a general guideline of where hangers, reflector supports and U-clips are to be installed.

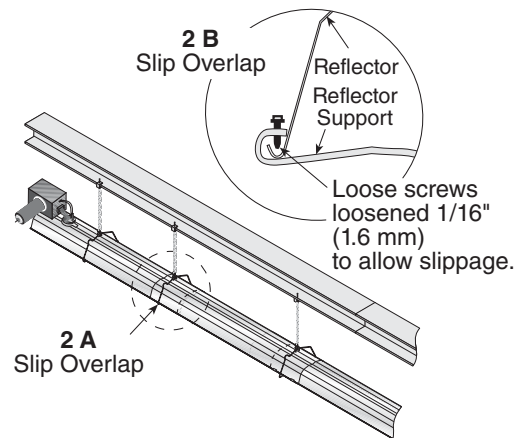
To ensure proper expansion and contraction movement of the reflectors, a combination of U-clips and reflector supports are used. The positioning of

reflector supports and U-clips depend on the individual installation. Use either pop rivets or sheet metal screws instead of u-clips when installing end caps and joint pieces in areas where impact and high wind may be a factor. The following rules must be observed.

1. The first reflector after the burner must be affixed in the middle of the reflector with a reflector support and tight screws.

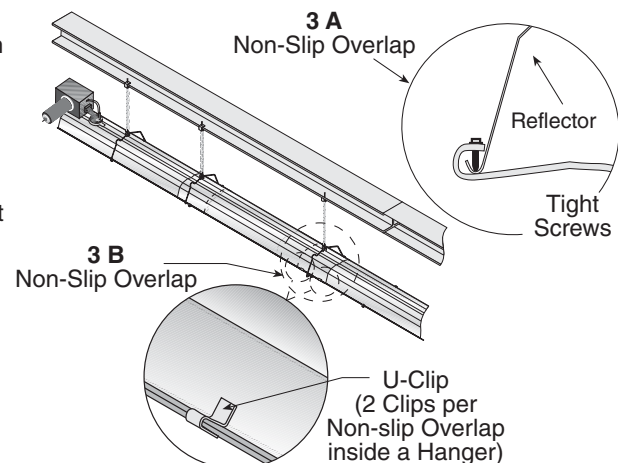


2. The overlap at the first and second reflector is a **slip overlap**. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
  - a.) both reflectors lay inside a hanger. (No reflector support needed).
  - b.) using a reflector support with loose screws at the reflector overlap.



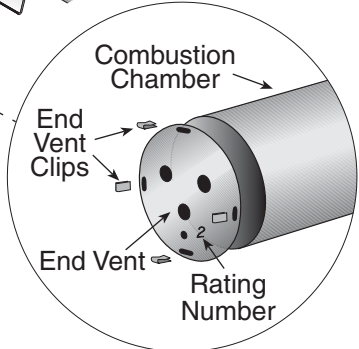
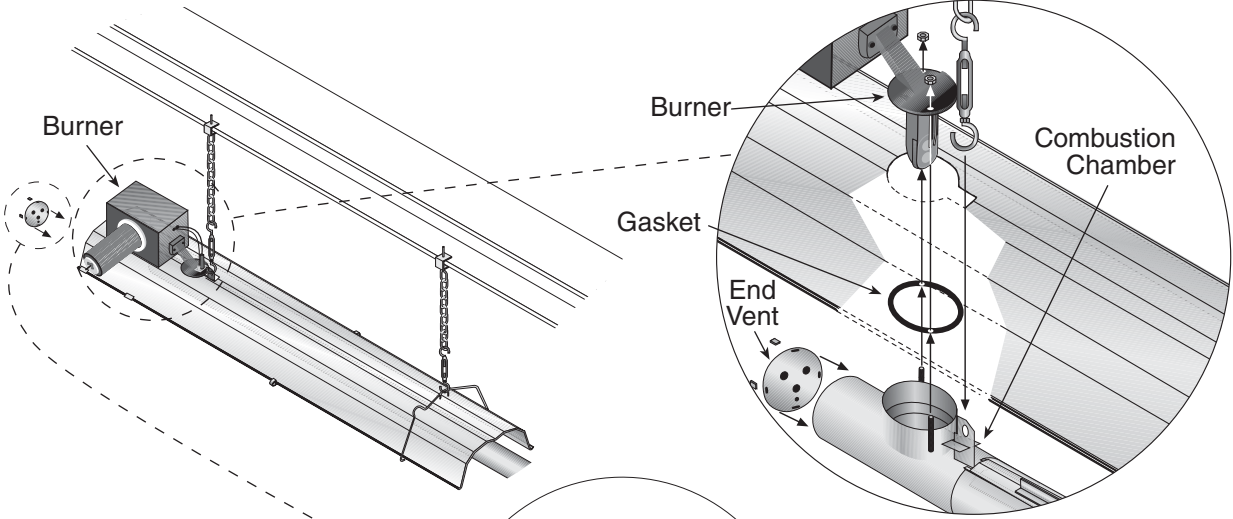
3. The remaining reflector overlaps require a **non-slip overlap connection**. To affix the reflectors together in a non-slip overlap either:
  - a.) use reflector support and tight screws.
  - b.) if both reflectors lay inside a hanger, u-clips or sheet metal screws may be used.

This section of three reflectors joined together must be affixed to the tube with at least one reflector support with tight screws.



Description	Part Number
<b>Reflector Support Package</b>	<b>03050010</b>
Wire Form	91908004
Reflector Support Strap	03050000
Screw #8 x 3/4	94320812
U-Clip Package	91107720
Reflector End Cap	027508XX

### Step 7.5 Burner Installation

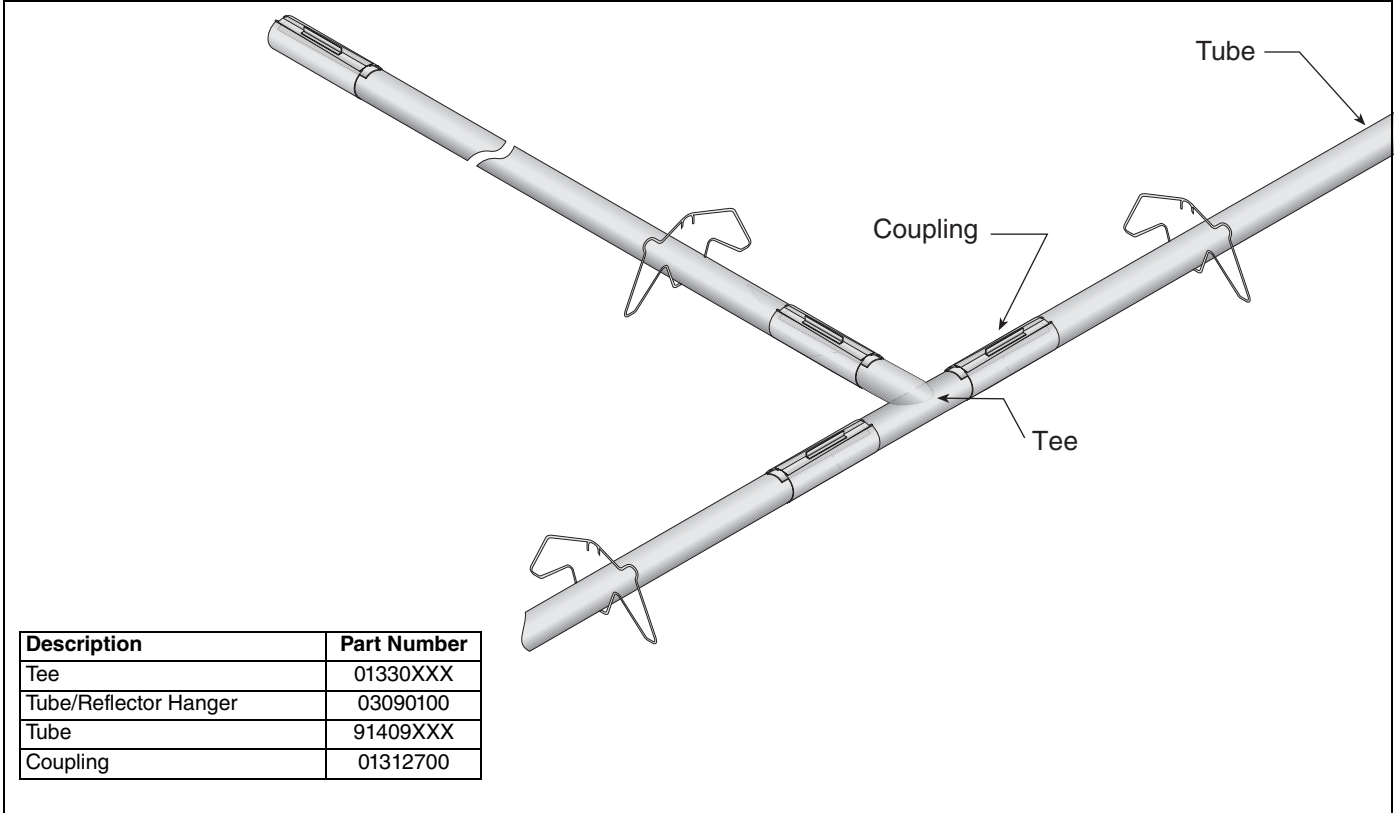


**NOTE:**  
Install end vent  
at end combustion  
chamber position only.

Description	Part Number
Bolt	94273914
Burner	0270XXXX
Lock Washer	96411600
Gasket	01367800
End Vent	013676XX

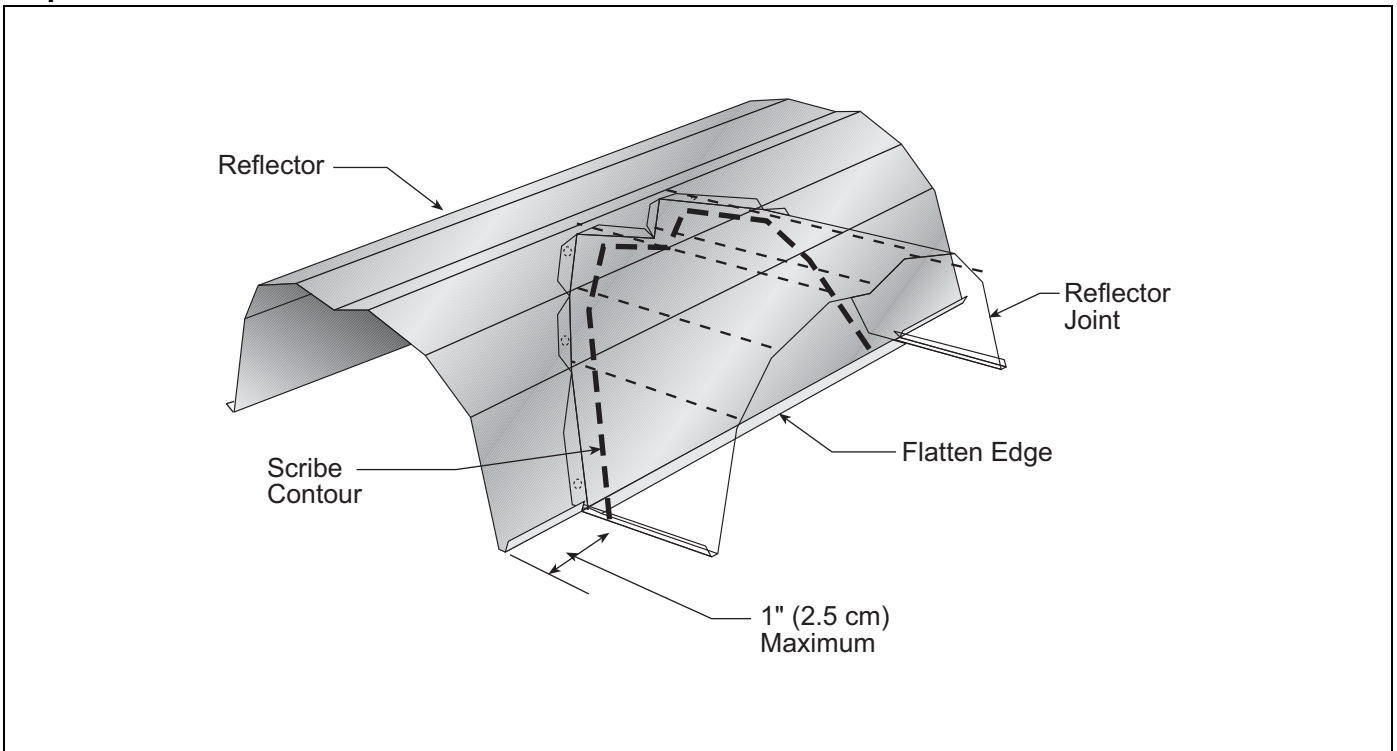
**SECTION 8: OPTIONAL HEATER ACCESSORIES**

**Step 8.1 Tee Installation**

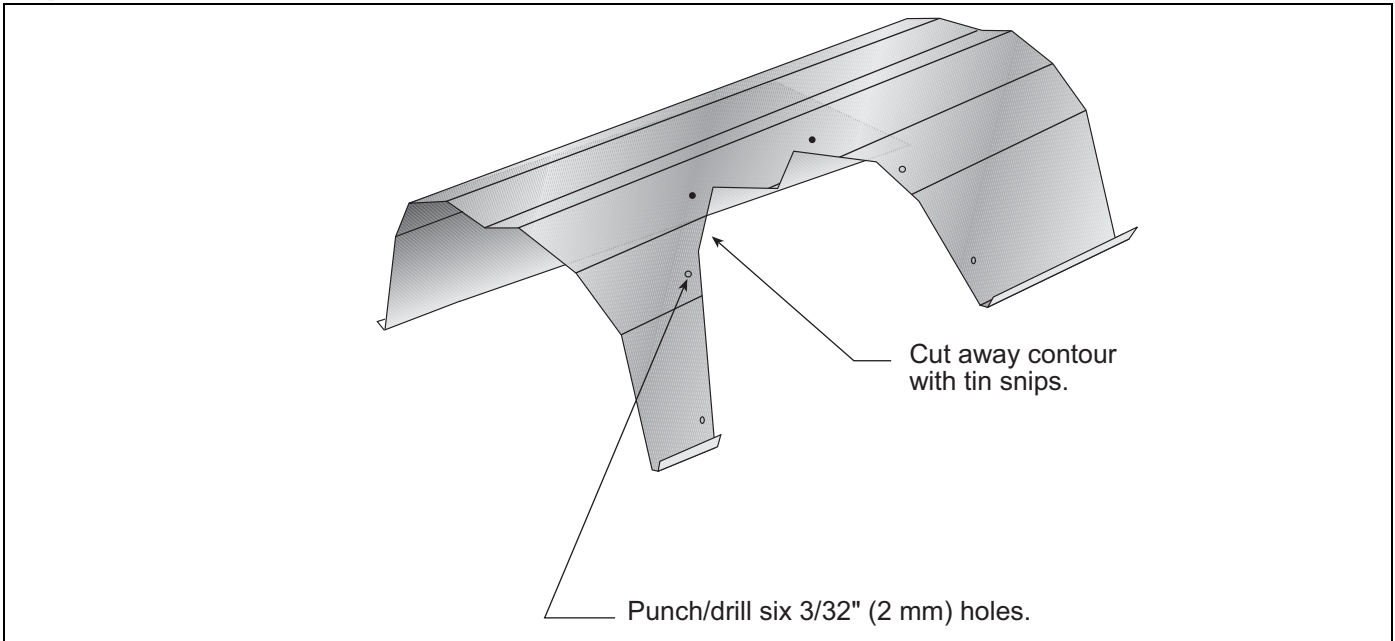


**Step 8.2 Reflector Joint**

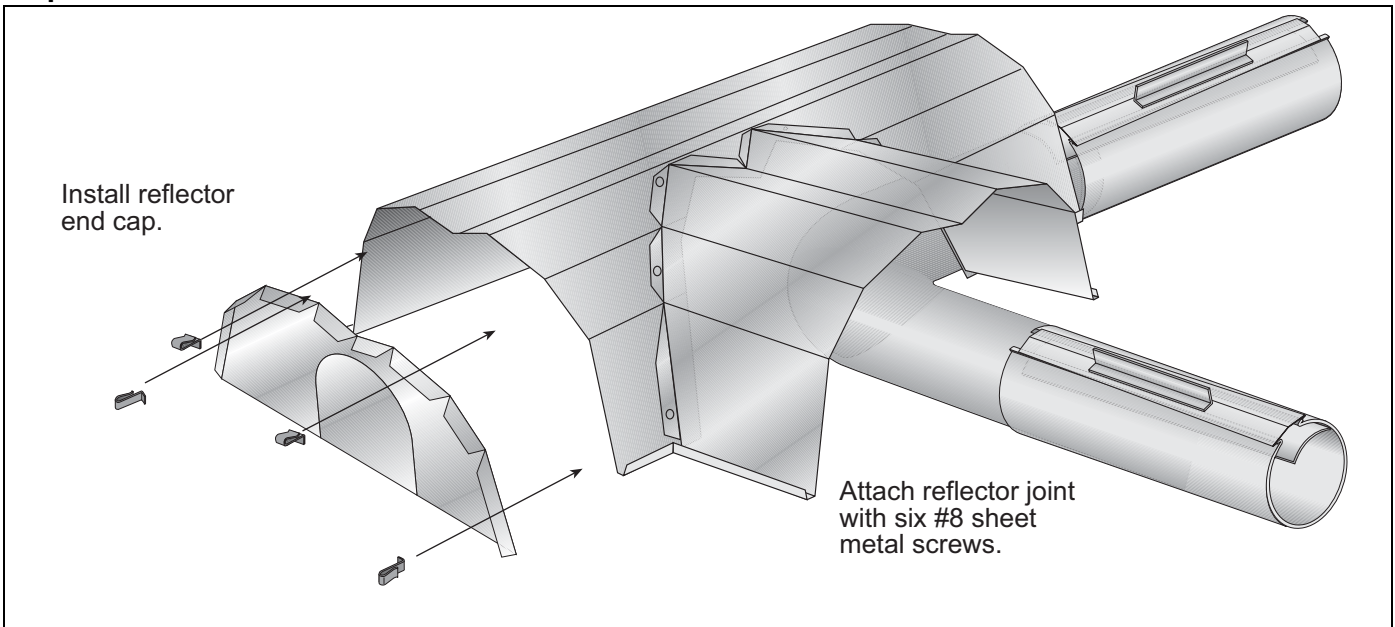
**Step 8.2.1 Reflector Joint Installation**



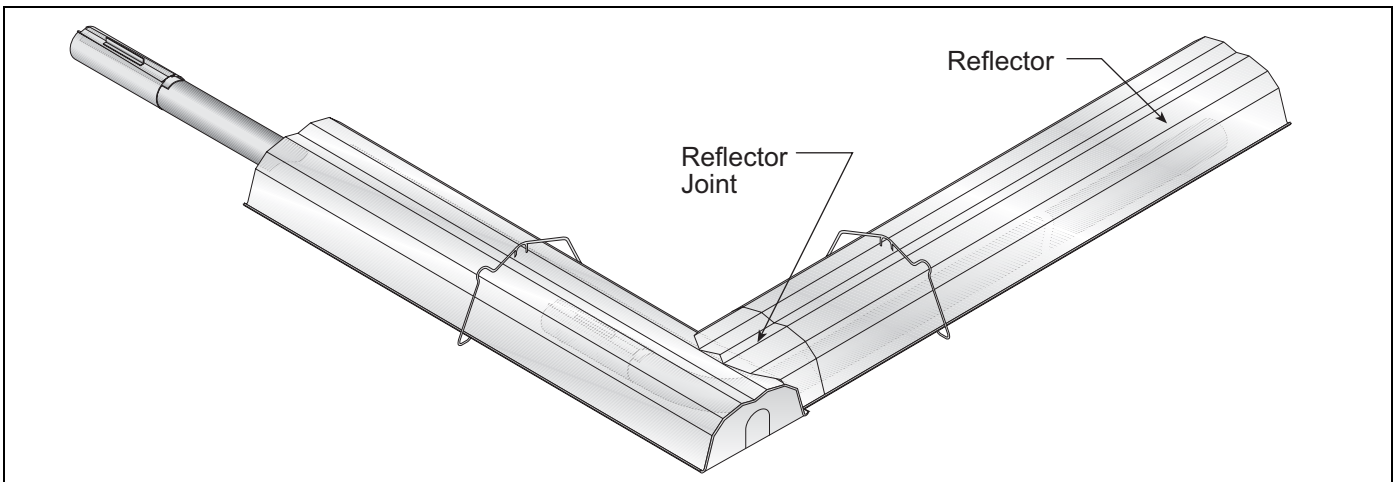
### Step 8.2.2 Reflector Joint Installation



### Step 8.2.3 Reflector Joint Detail

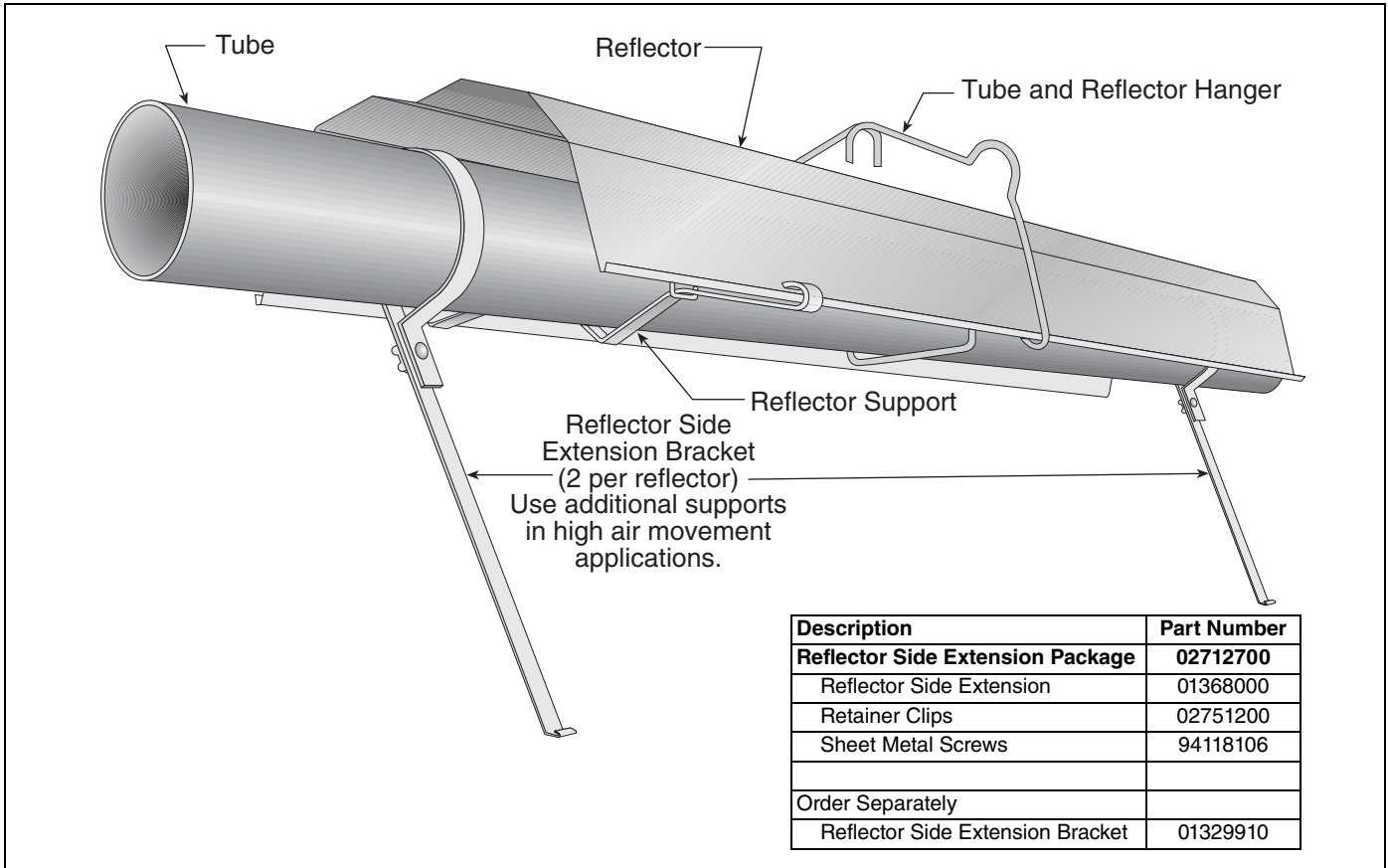


**FIGURE 13: Reflector Joint Detail**

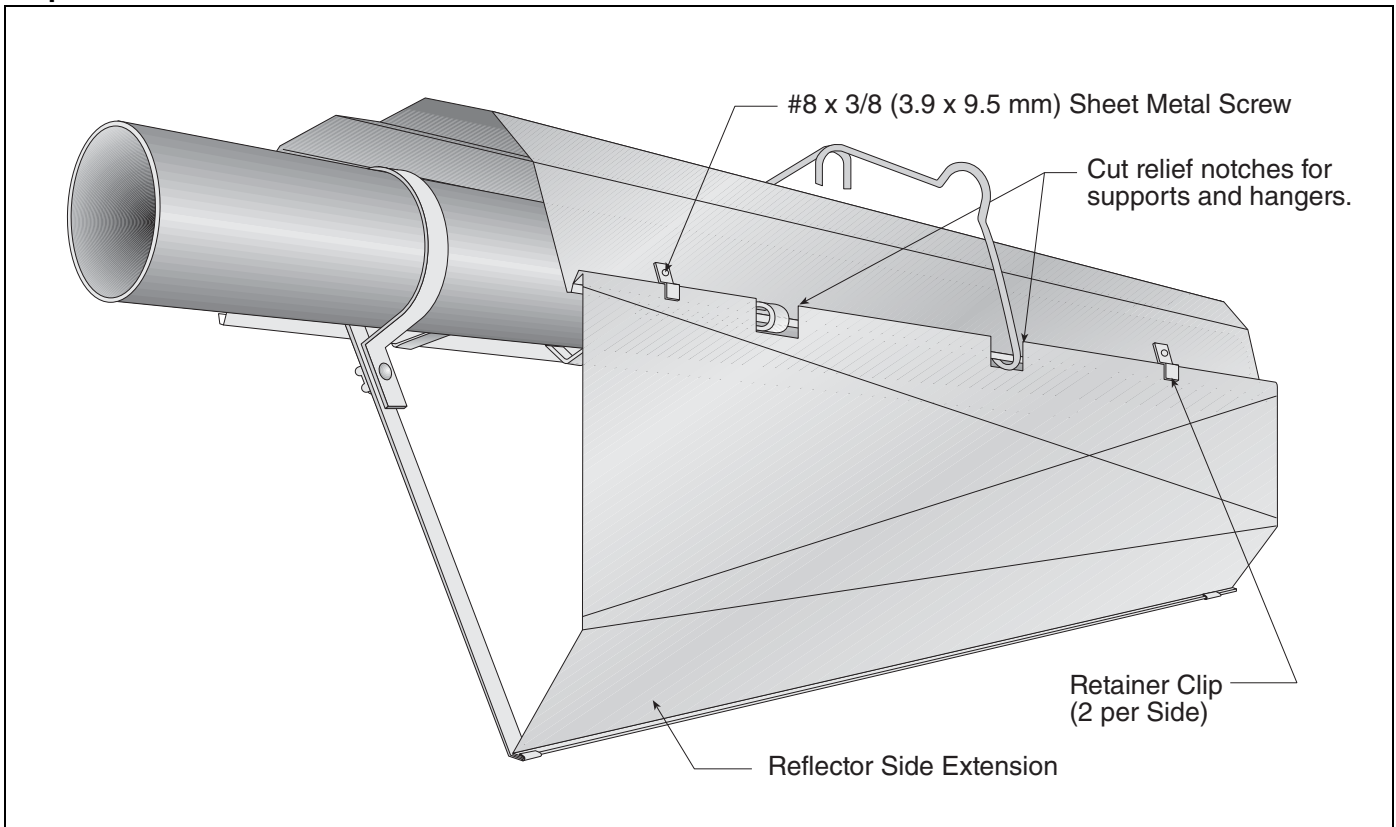


### 8.3 Reflector Side Extension

#### Step 8.3.1 Bracket Installation

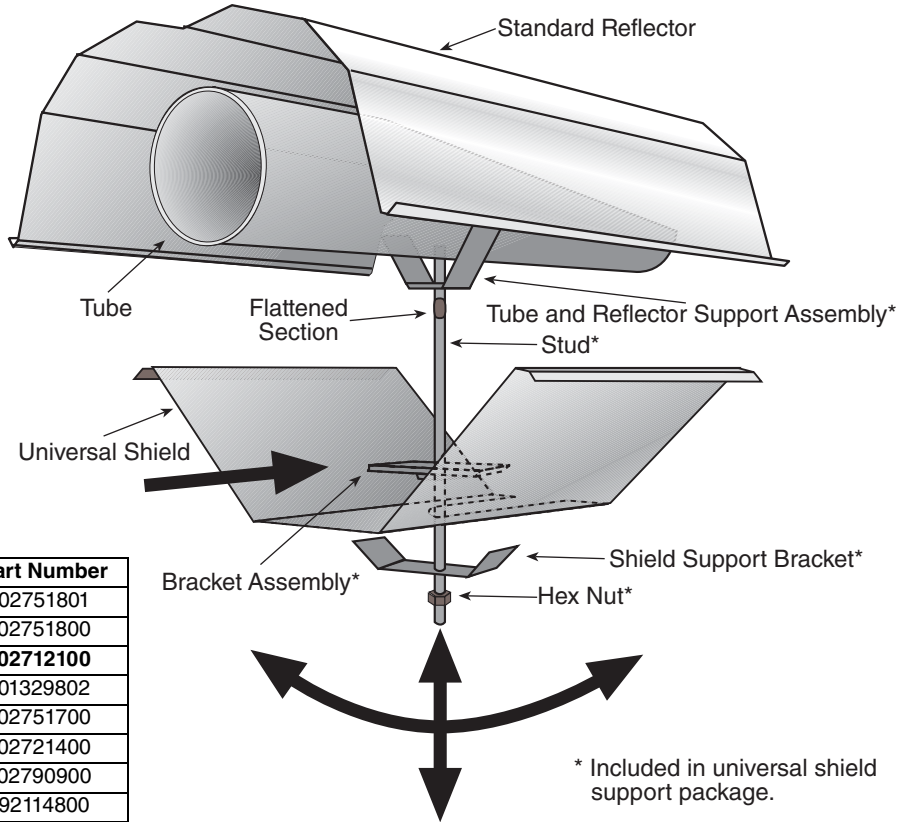


#### Step 8.3.2 Side Reflector Installation



### 8.4 Universal Shield

Universal shields are adjustable aluminum reflectors whose angle and height can be adjusted to direct heat to or away from a desired area. See Page 5, Figure 4 through Page 5, Figure 6 for positions.

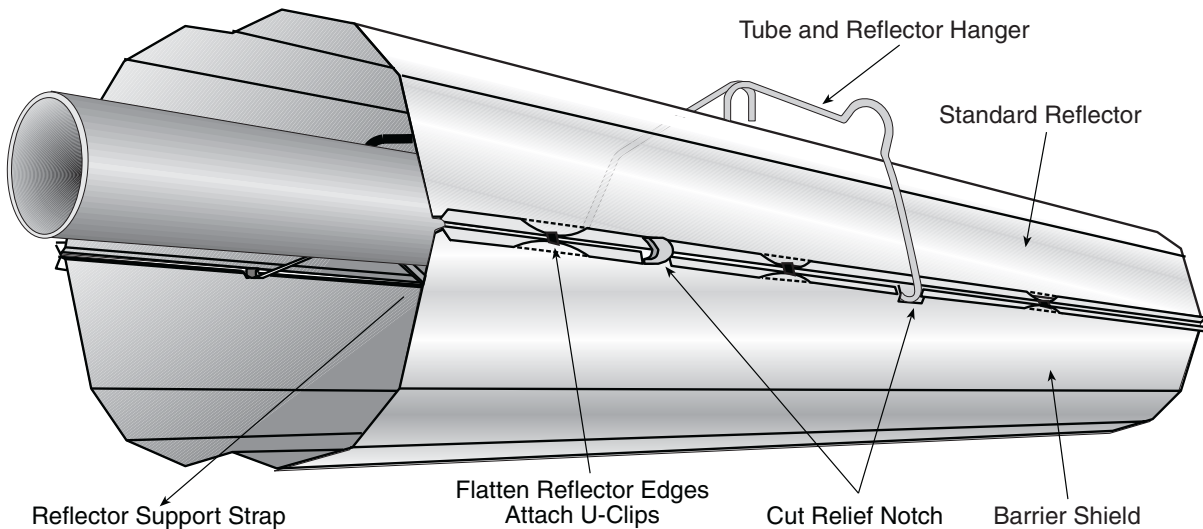


Description	Part Number
Universal Shield	02751801
Universal Shield with Holes	02751800
<b>Universal Shield Support Package</b>	<b>02712100</b>
Tube and Reflector Support Assembly	01329802
Universal Shield Support	02751700
Shield Bracket Assembly	02721400
Stud	02790900
Hex Nut	92114800

\* Included in universal shield support package.

### 8.5 Barrier Shield

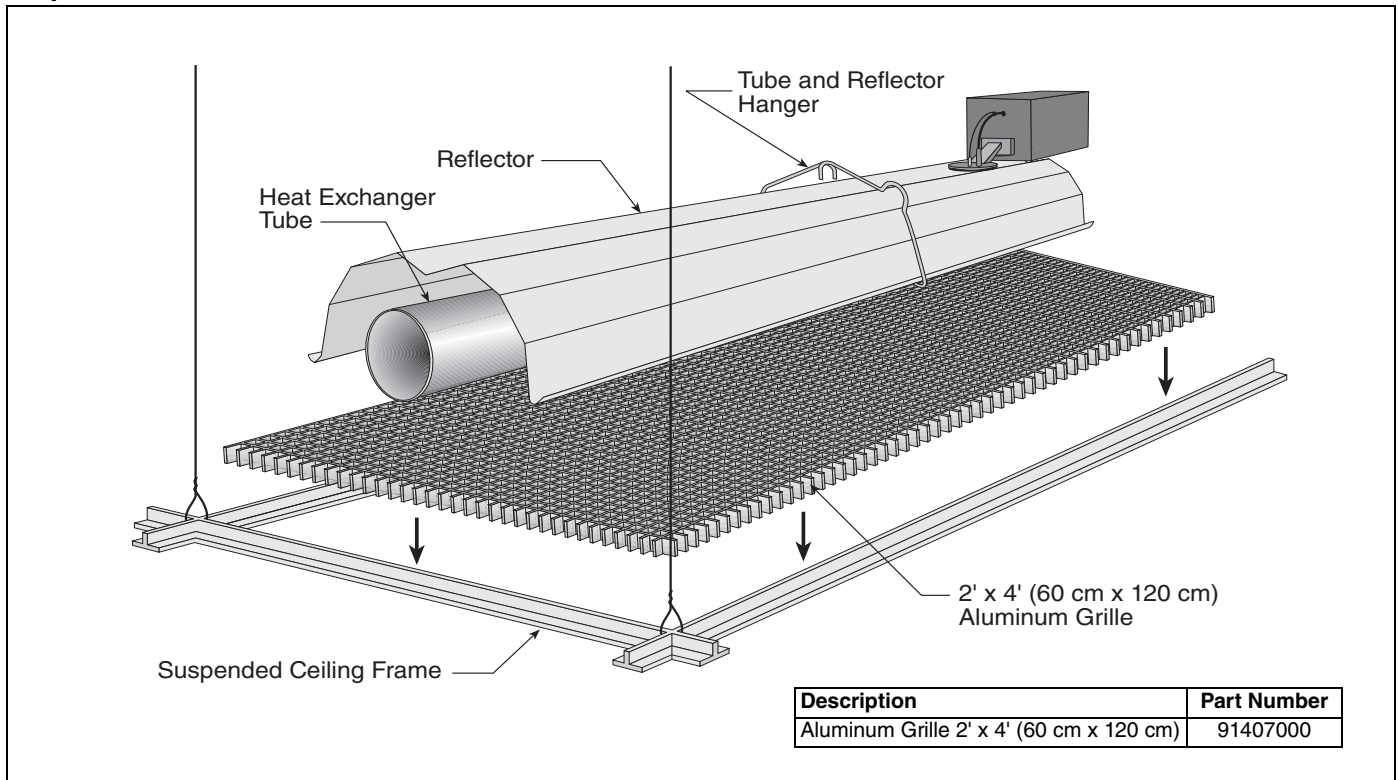
Do not install barrier shield less than 20' (6 m) downstream of any burner.  
 Do not attach end caps to the ends of the barrier shields. For lengths greater than 8' (2.6 m), use universal shields.  
 Do not use barrier shields for burner sizes larger than 80,000 Btu/h.



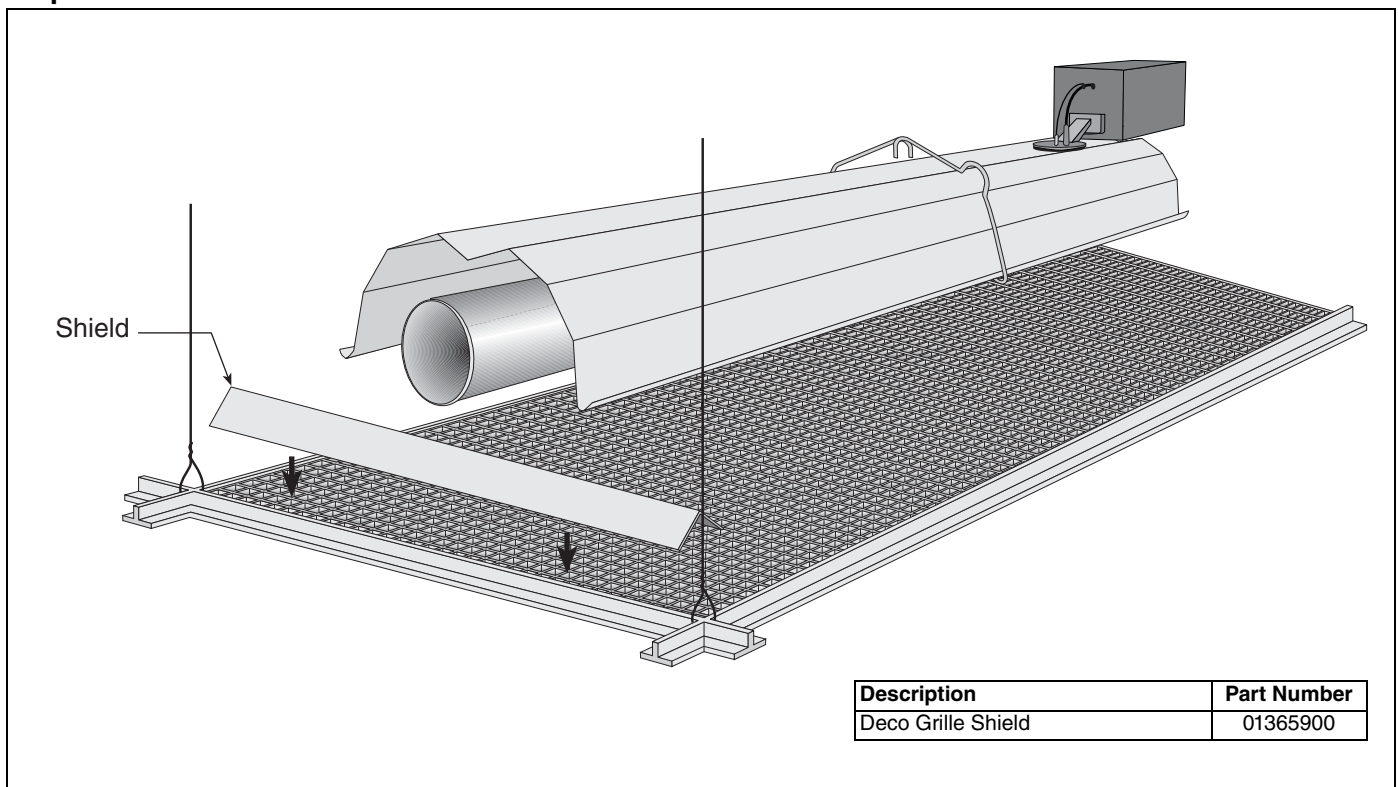
Description	Part Number
Barrier Shield	02750303
U-Clip Package	91107720

## 8.6 Two-Foot Decorative Grille Installation

### Step 8.6.1 Grille Installation

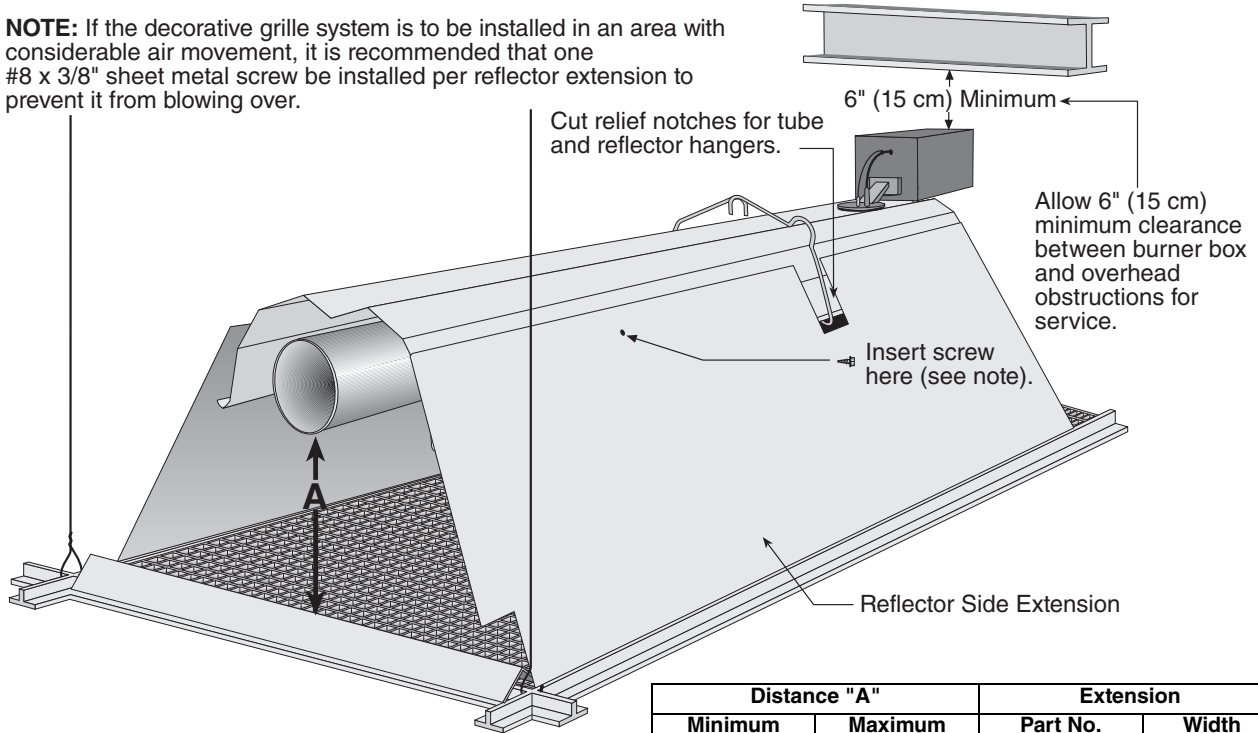


### Step 8.6.2 Frame Shield Installation



### Step 8.6.3 Reflector Side Extension Installation for Decorative Grilles

**NOTE:** If the decorative grille system is to be installed in an area with considerable air movement, it is recommended that one #8 x 3/8" sheet metal screw be installed per reflector extension to prevent it from blowing over.

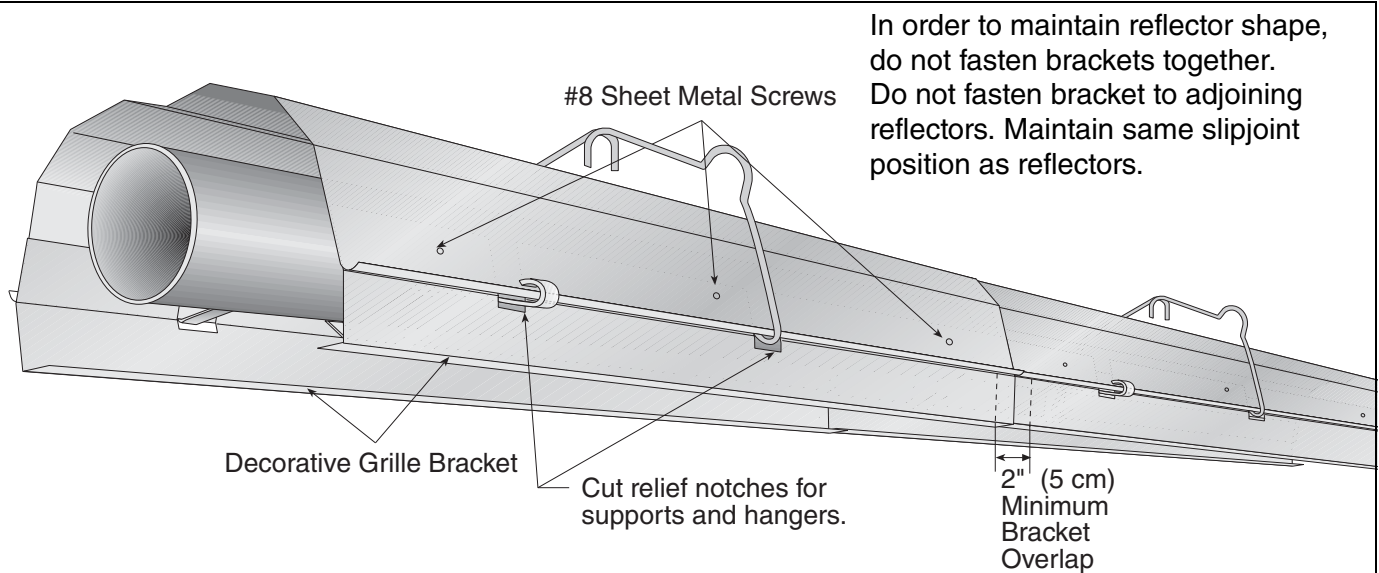


Distance "A"		Extension	
Minimum	Maximum	Part No.	Width
2" (4 cm)	6" (15 cm)	01370408	8" (20 cm)
6" (15 cm)	10" (26 cm)	01370412	12" (30 cm)
10" (26 cm)	14" (37 cm)	01370416	16" (40 cm)

Description	Part Number
Reflector Side Extension	01370412

## 8.7 One-Foot Decorative Grille Installation

### Step 8.7.1 One-Foot Decorative Grille Bracket

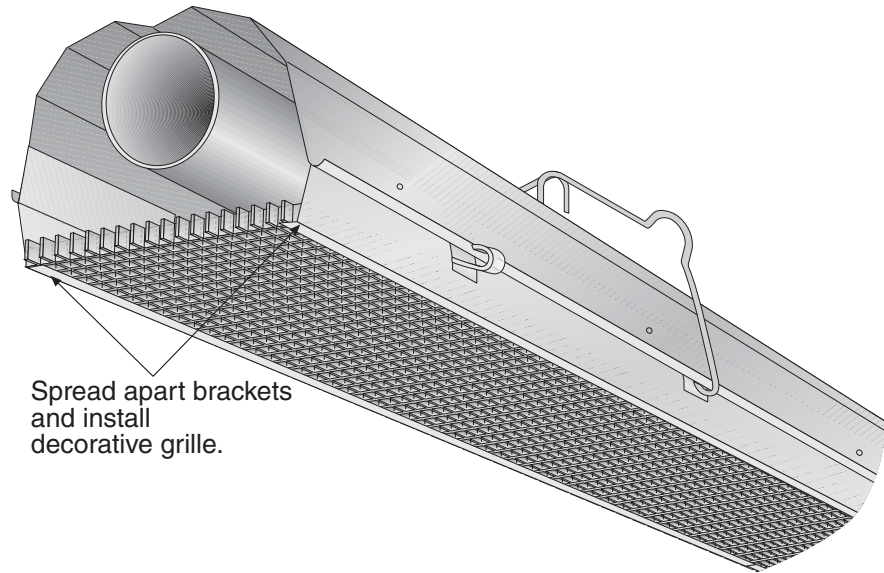


In order to maintain reflector shape, do not fasten brackets together. Do not fasten bracket to adjoining reflectors. Maintain same slipjoint position as reflectors.

Description	Part Number
Bracket	01363003

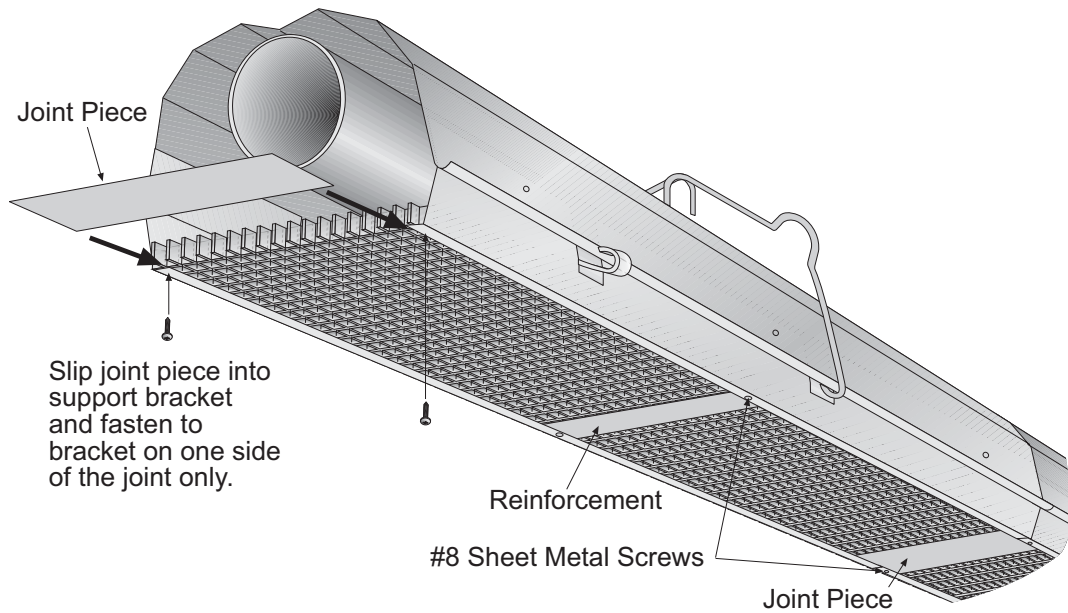


### Step 8.7.2 Decorative Grille



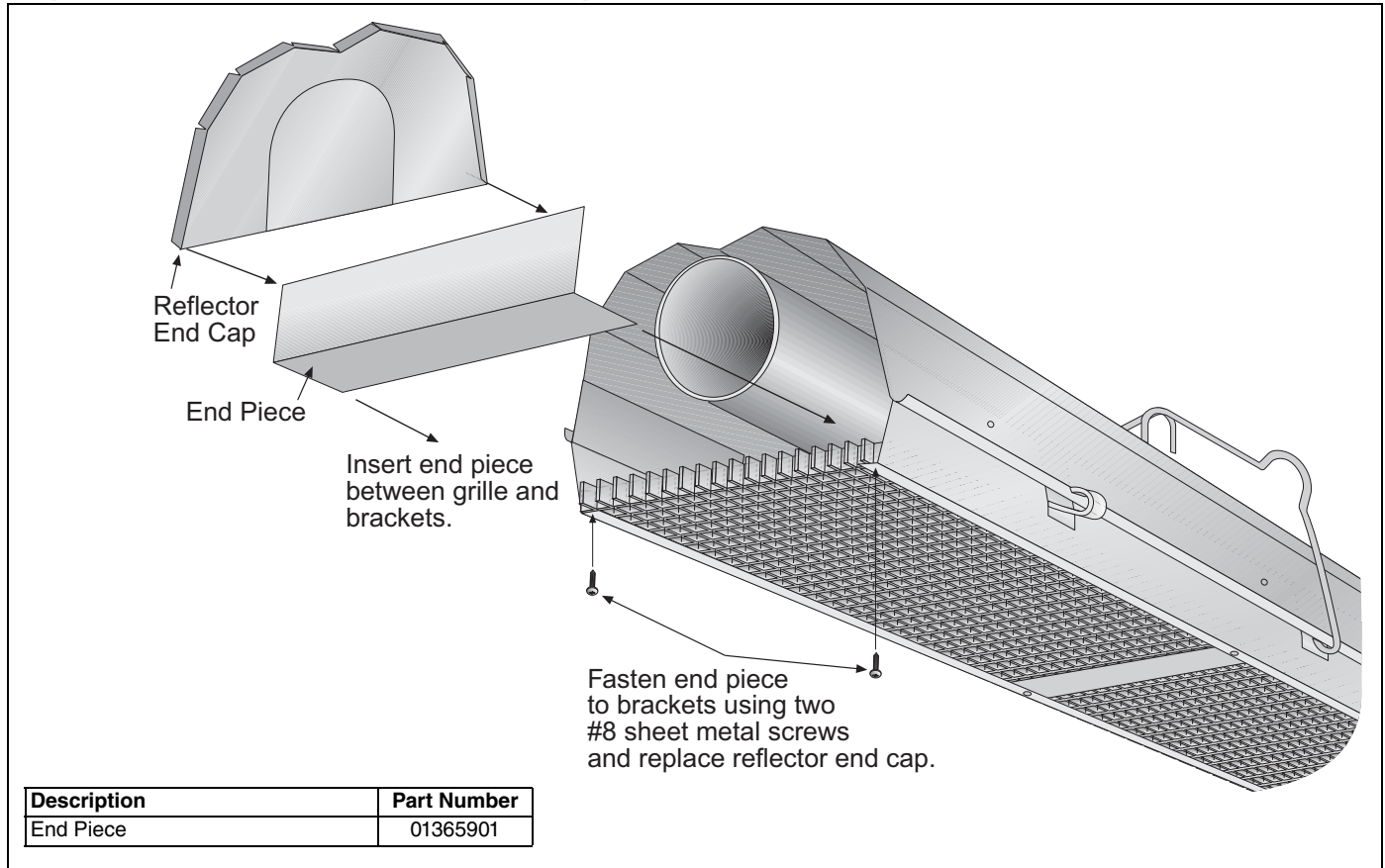
Description	Part Number
Decorative Grille 8' x 1' (2.4 m x .3 m)	91406700

### Step 8.7.3 Joint Piece and Reinforcement

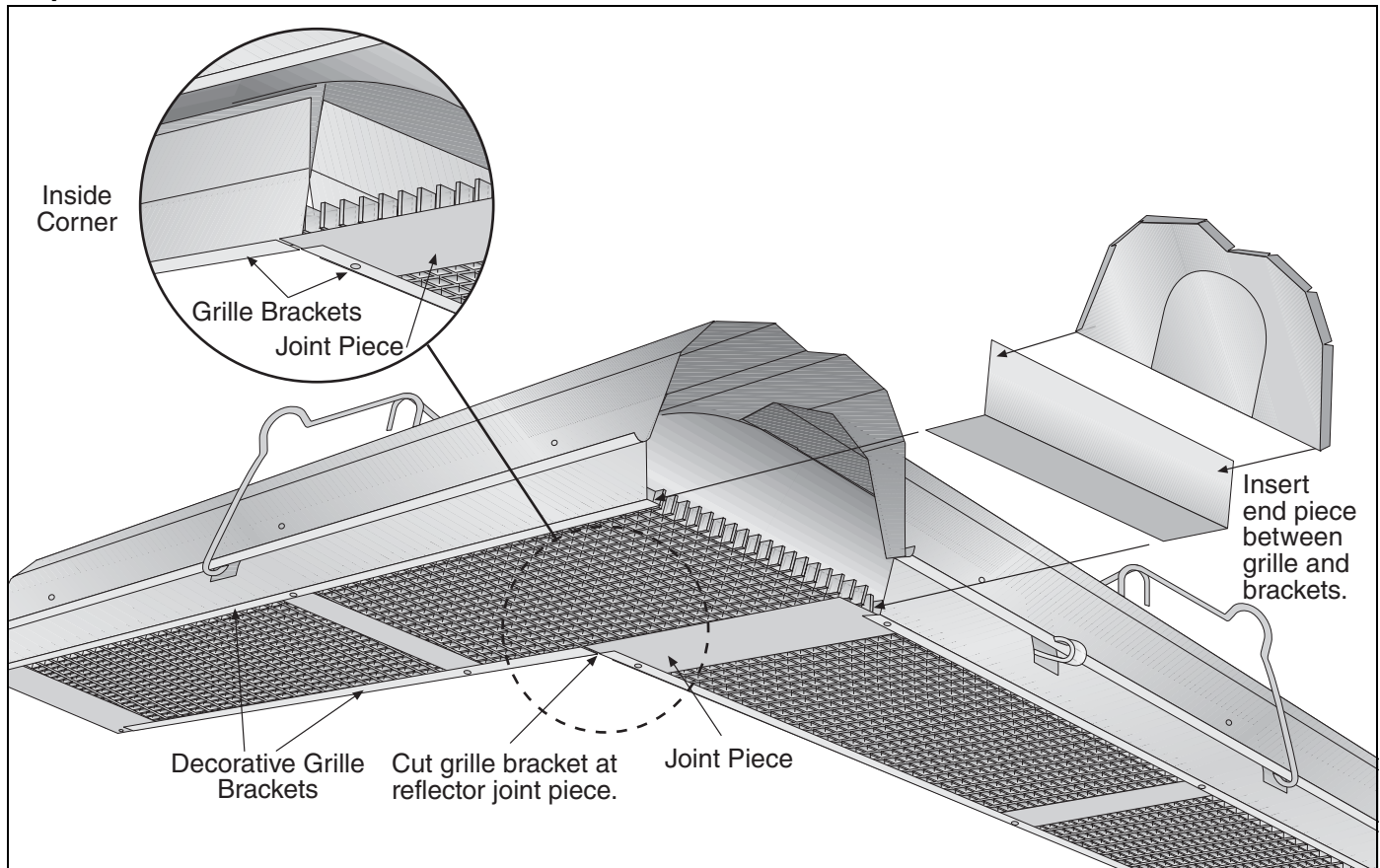


Description	Part Number
Joint Piece	01365903
Reinforcement	01365902

### Step 8.7.4 End Piece and Reflector End Cap

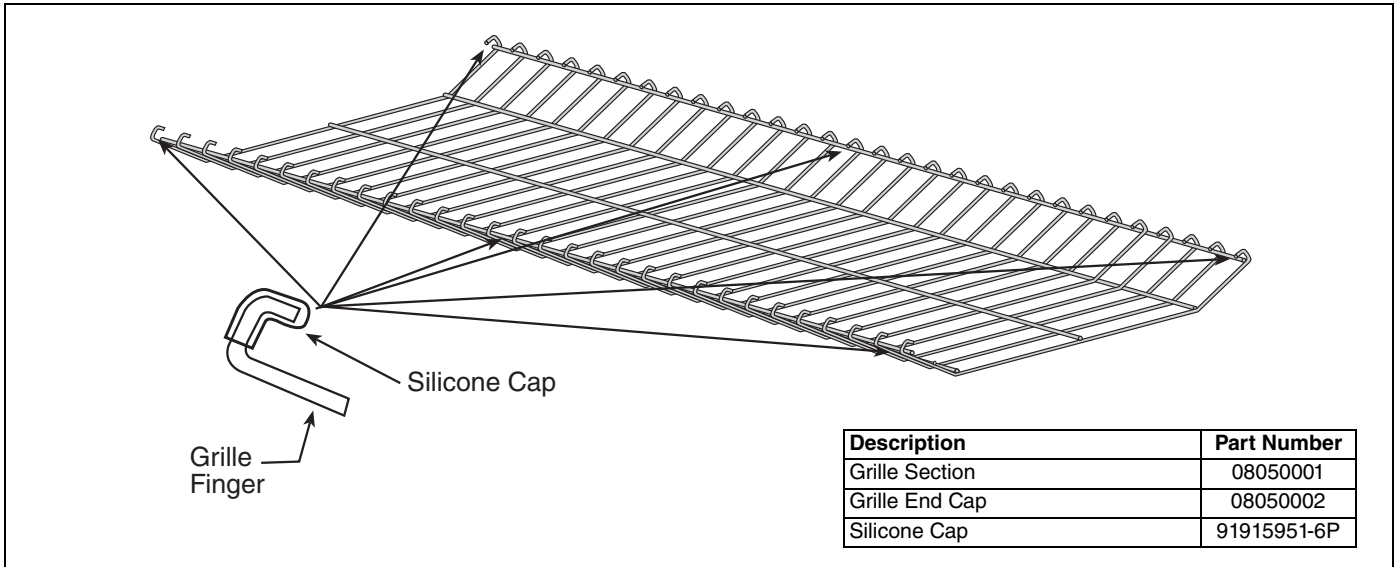


### Step 8.7.5 90° Elbow

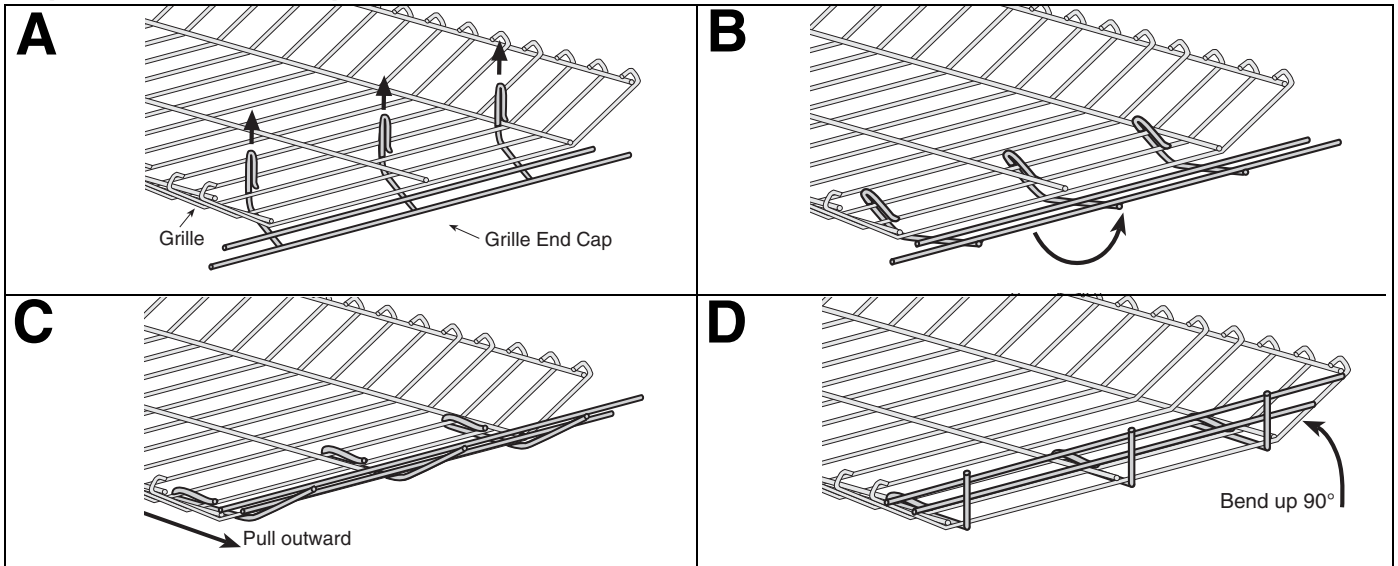


## 8.8 Protective Grille Installation

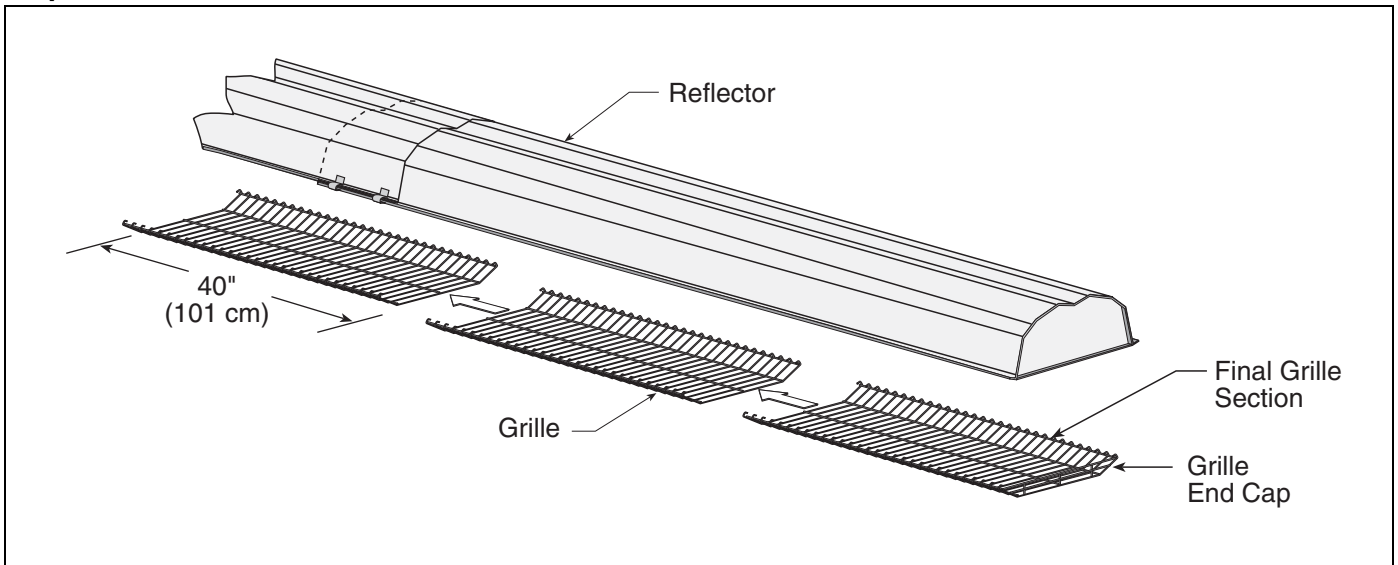
### Step 8.8.1 Silicone Cap Installation



### Step 8.8.2 Grille End Cap Installation




### Step 8.8.3 Grille Installation



**Step 8.9 Classic Cast-Iron Components**

**⚠ WARNING**



**Suspension Hazard**

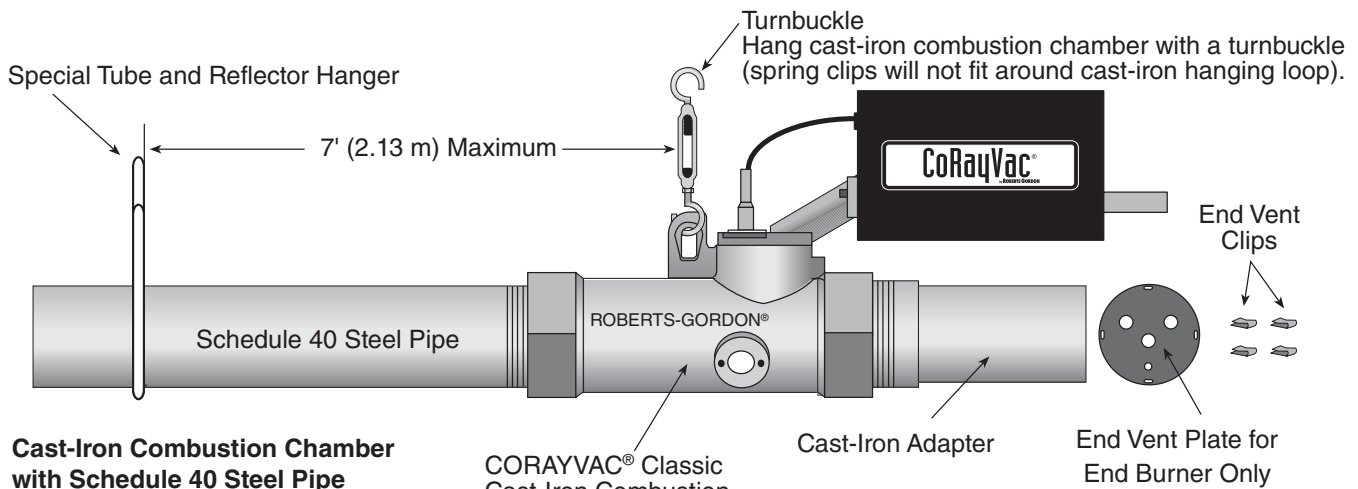
Hang heater with materials with a minimum working load of 750 lbs. (340 kg).

Use special tube and reflector hangers when suspending the schedule 40 steel pipe system.

Schedule 40 steel pipe is heavy and will fall if not supported properly.

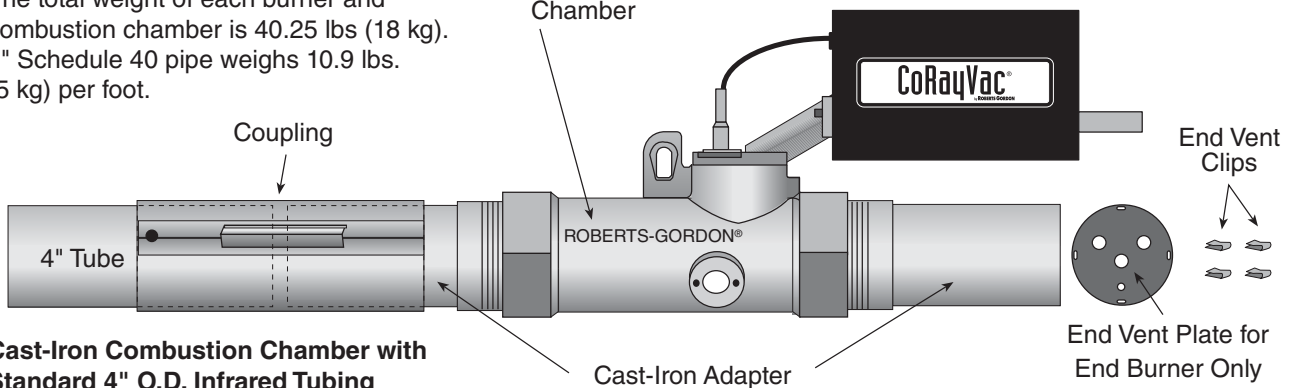
Distance between supports must be 7' (2.13 m) or less.

Failure to follow these instructions can result in death, injury or property damage.



**Cast-Iron Combustion Chamber with Schedule 40 Steel Pipe**

The total weight of each burner and combustion chamber is 40.25 lbs (18 kg).  
 4" Schedule 40 pipe weighs 10.9 lbs. (5 kg) per foot.



**Cast-Iron Combustion Chamber with Standard 4" O.D. Infrared Tubing**

The total weight of each burner and combustion chamber is 40.25 lbs (18 kg).  
 4" O.D. 16 Ga. tubing weighs 2.8 lbs. (1.3 kg) per foot.

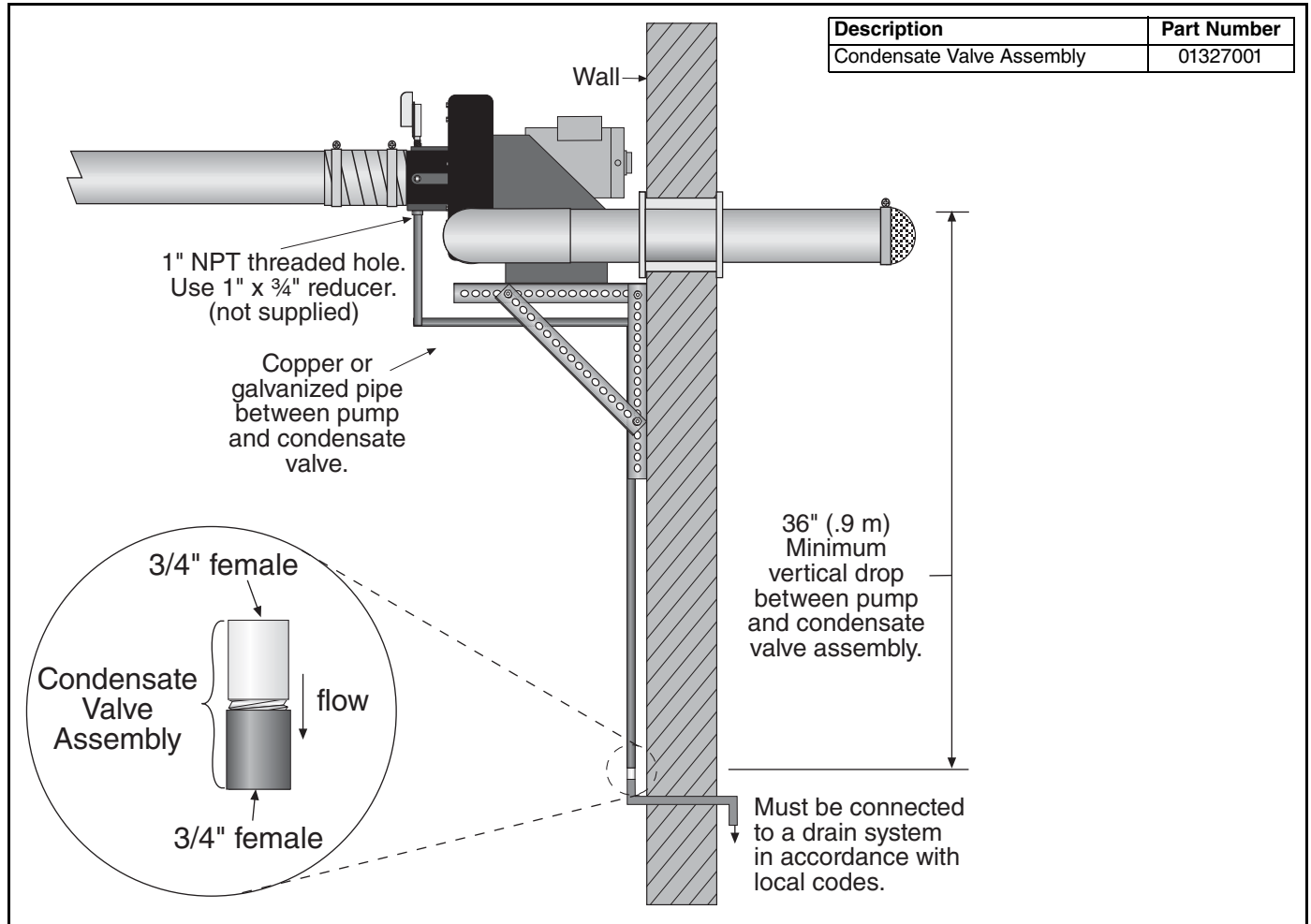
Description	Part Number
Special Tube & Reflector Hanger	02790300
Turnbuckle	91903201
Cast-Iron Combustion Chamber	02721200-1P
Cast-Iron Adapter	02722100
Coupling	01312700

## SECTION 9: PUMP INSTALLATION AND VENTING

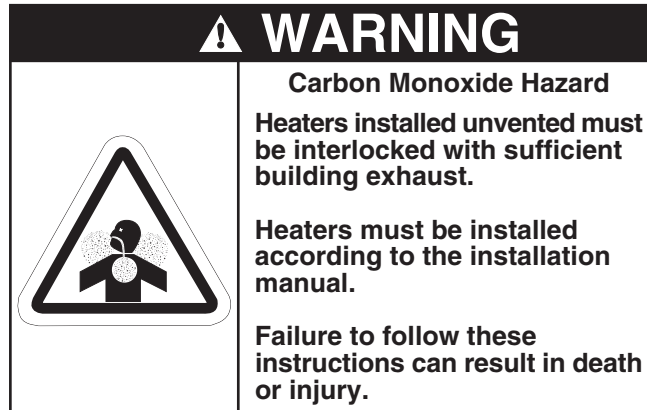
## 9.1 Pump Installation

For complete pump installation, please refer to the EP-100, EP-200 or EP-300 Series Installation, Operation and Service Manuals.

FIGURE 14: EP-200 Condensate Valve Assembly



## 9.2 General Venting Requirements Model EP-100, EP-200 and EP-300 Series Pumps



This heater must be vented in accordance with the rules contained in this manual and with the following national codes and any state, provincial or local codes which may apply: **United States:** Refer to ANSI Z223.1 (NFPA 54) - latest revision; **Canada:** Refer to CAN/CGA-B149.1 and B149.2 - latest revision.

Any portion of vent pipe passing through a combustible wall must have an approved thimble to conform with the above listed codes.

Vent pipe must be sloped downward away from the pump  $\frac{1}{4}$ " every 10' (3 m).

The bottom of the vent or air intake terminal shall not be located less than 1' (.3 m) above grade level.

The vent shall not terminate less than 7' (2.1 m) above grade where located adjacent to public walkways.

Vent terminal must be installed at a height sufficient to prevent blockage by snow, and building materials protected from degradation by flue gases.

Secure all joints with #8 x  $\frac{3}{8}$  sheet metal screws.

Seal all joints with high temperature silicone sealant.

Vent terminal must be beyond any combustible overhang.

### 9.2.1 Vertical Venting

See Page 33, Figure 15 for recommended vertical venting options.

### 9.2.2 Horizontal Venting

See Page 34, Figure 16 through Page 36, Figure 18 for recommended horizontal venting options.

### 9.2.3 United States Requirements

Vent must terminate at least 3' (.9 m) above any forced air inlet located within 10' (3.1 m).

Vent must terminate at least 4' (1.2 m) below, 4' (1.2 m) horizontally from, or 1' (.3 m) above any door, operable window, or gravity air inlet into any building.

### 9.2.4 Canadian Requirements

The vent shall not terminate within 6' (1.8 m) of a mechanical air supply inlet to any building.

The vent shall not terminate within 3' (.9 m) of a window or door that can be opened in any building, any non-mechanical air supply inlet to any building, or of the combustion air inlet of any other appliance.

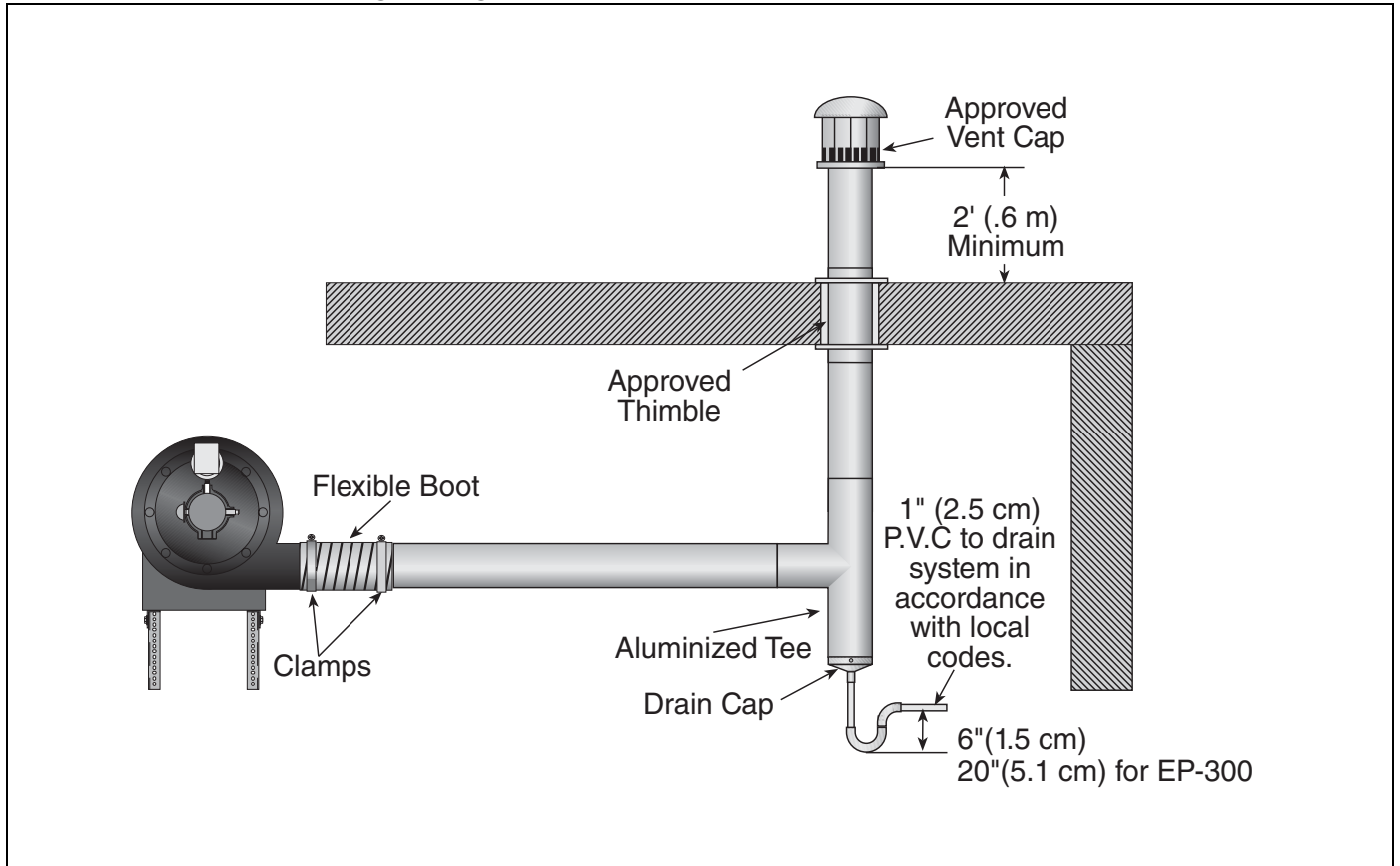
### Length Requirements

See Page 33, Figure 15 through Page 36, Figure 18 for recommended vent lengths and sizes.

Seal all pipe joints with high temperature silicone sealant in the vent pipe. Insulation and additional sealing measures will be required.

Optional heat exchanger lengths are considered as vent length for length determination.

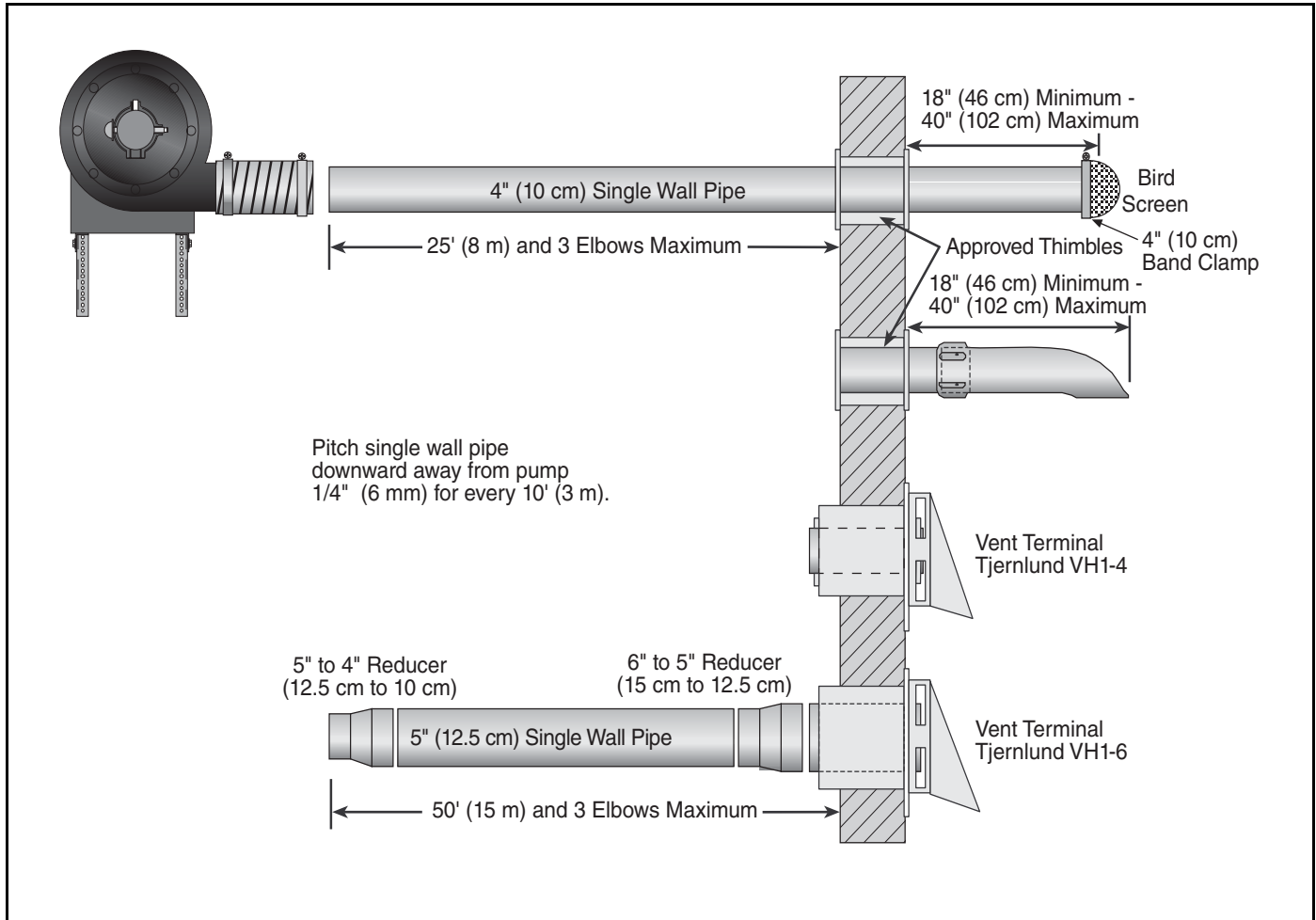
Subtract 15' (4 m) of maximum allowed vent or outside air duct length per vent elbow if more than three are used.

**FIGURE 15: Vertical Venting Configuration**

Part Number	Description	Part Number	Description
01330203	Tee, 4" (10 cm) Aluminized	91409403	Tube, Aluminized 4" (10 cm) dia. 10' (3 m)
01330204	Tee, 6" (15 cm) Aluminized	91409420	Tube, Aluminized 6" (15 cm) dia. 10' (3 m)
01331900	Damper Coupling, 4" (10 cm)	91412800	Flexible Boot, 4" (10 cm)
01335801	Elbow, 4" (10 cm) Aluminized 90°	91412801	4 - Flexible Boot, 1/2" (1.3 cm)
02718851	Drain Cap, 4" (10 cm)	91412802	Flexible Boot, 6" (15 cm)
02718852	Drain Cap Assembly, 6" (15 cm)	91901300	Boot Clamp, 4" (10 cm)
90502300	Vent Cap, 4" (10 cm) Metalbestos	91913703	Boot Clamp, 6" (15 cm)
90502302	Vent Cap, 6" (15 cm) Metalbestos	E0009356	Damper Coupling, 6" (15 cm)
90505600	Wall Thimble, 4" (10 cm)	T0100320	Elbow, 6" (15 cm) Aluminized 90°

### 9.3 Horizontal Venting 4" (10 cm) Pipe

**FIGURE 16: EP-100 Horizontal Venting Configurations**

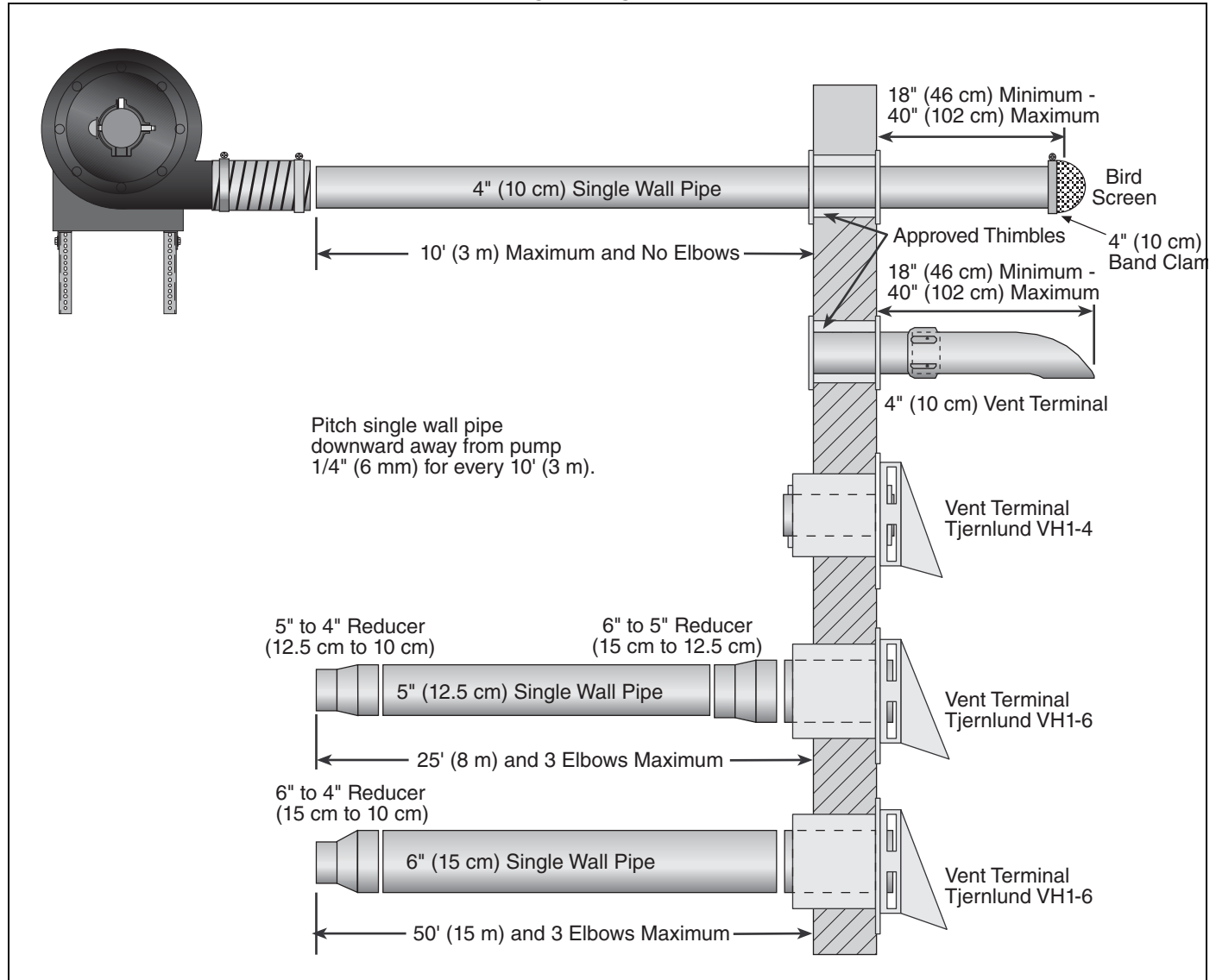


Part Number	Description
01330203	Tee, 4" (10 cm) Aluminized
01331900	Damper Coupling, 4" (10 cm)
01335801	Elbow, 4" (10 cm) Aluminized 90°
01365400	Bird Screen, 4" (10 cm)
02537801-1P	Vent Terminal (Non-Combustible Wall)
02718851	Drain Cap, 4" (10 cm)
90502100	Vent Terminal, 4" (10 cm) (Combustible Wall)
90502101	Vent Terminal, 6" (15 cm) (Combustible Wall)

Part Number	Description
90505600	Wall Thimble, 4" (10 cm)
91409403	Tube, Aluminized 4" (10 cm) dia. 10' (3 m)
91412800	Flexible Boot, 4" (10 cm)
91901300	Boot Clamp, 4" (10 cm)
Not Supplied	Tube, Aluminized 5" (12.7 cm) dia. 10' (3 m)
Not Supplied	Tube Adapter, 5" (12.7 cm) dia. x 4" (10 cm) dia.
Not Supplied	Tube Adapter, 6" (15.2 cm) dia. x 5" (12.7 cm) dia.

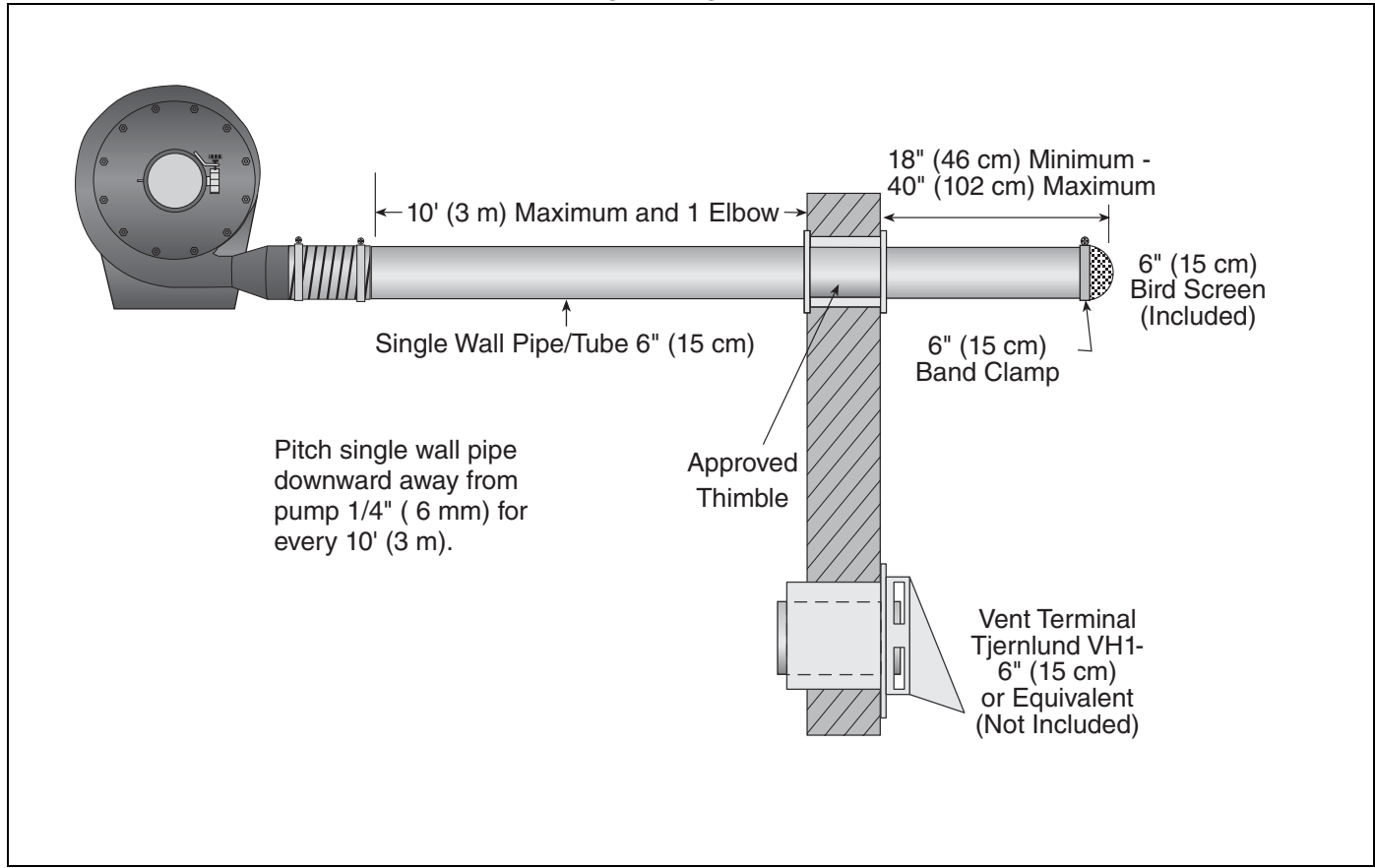


FIGURE 17: EP-200 Series Horizontal Venting Configurations



Part Number	Description	Part Number	Description
01330203	Tee, 4" (10 cm) Aluminized	91409403	Tube, Aluminized 4" (10 cm) dia. 10' (3 m)
01331900	Damper Coupling, 4" (10 cm)	91409420	Tube, Aluminized 6" (15 cm) dia. 10' (3 m)
01335801	Elbow, 4" (10 cm) Aluminized 90°	91412801	4 - Flexible Boot, 1/2" (1.3 cm)
01365400	Bird Screen, 4" (10 cm)	91418200	Tube Adapter, 6" (15.2 cm) dia. x 4" (10 cm) dia.
02537801-1P	Vent Terminal (Non-Combustible Wall)	91901300	Boot Clamp, 4" (10 cm)
02718851	4" Drain Cap	91906900	Silicone Ring
90502100	Vent Terminal, 4" (10 cm) (Combustible Wall)	Not Supplied	Tube, Aluminized 5" (12.7 cm) dia. 10' (3 m)
90502101	Vent Terminal, 6" (15 cm) (Combustible Wall)	Not Supplied	Tube Adapter, 5" (12.7 cm) dia. x 4" (10 cm) dia.
90505600	Wall Thimble, 4" (10 cm)	Not Supplied	Tube Adapter, 6" (15.2 cm) dia. x 5" (12.7 cm) dia.

**FIGURE 18: EP-300 Series Horizontal Venting Configurations**



Part Number	Description
01330203	Tee, 4" (10 cm) Aluminized
01330204	Tee, 6" (15 cm) Aluminized
01331900	Damper Coupling, 4" (10 cm)
01335801	Elbow, 4" (10 cm) Aluminized 90°
01397400	Bird Screen, 6" (15 cm)
02537801-1P	Vent Terminal (Non-Combustible Wall)
02718851	Drain Cap, 4" (10 cm)
02718852	Drain Cap, 6" (15 cm)
90502100	Vent Terminal, 4" (10 cm) (Combustible Wall)
90502101	Vent Terminal, 6" (15 cm) (Combustible Wall)
90502302	Vent Cap, 6" (15 cm) Metalbestos
90505600	Wall Thimble, 4" (10 cm)

Part Number	Description
91409403	Tube, Aluminized 4" (10 cm) dia. 10' (3 m)
91409420	Tube, Aluminized 6" (15 cm) dia. 10' (3 m)
91412800	Flexible Boot, 4" (10 cm)
91412802	Flexible Boot, 6" (15 cm)
91418200	Tube Adapter, 6" (15.2 cm) dia. x 4" (10 cm) dia.
91901300	Boot Clamp, 4" (10 cm)
91913703	Boot Clamp, 6" (15 cm)
E0009356	Damper Coupling, 6" (15 cm)
T0100320	Elbow, 6" (15 cm) Aluminized 90°

## SECTION 10: OUTSIDE AIR SUPPLY

The CRV-Series system is approved for use with an outside air system. Halogenated hydrocarbons or other corrosive chemicals in the air can be drawn into the equipment and seriously damage the system components. Avoid the use of such chemical compounds near the air inlet to the heaters.

**IMPORTANT:** If the building has a slight negative pressure or contaminants are present in the air, an outside combustion air supply to the heaters is strongly recommended.

All joints and seams in the air supply system must be airtight. Attach the filter housing to the burner assembly using the wing nut provided.

### 10.1 Pressurized

See Page 39, Figure 23 for a typical layout of a pressurized air supply system.

For pressurized outside air supplies, the outside air

blower motor has a pressure switch interlock that must be used. Wire this switch in series with the pump pressure switch. When using an outside air blower with a ROBERTS GORDON® System Control or ROBERTS GORDON® ULTRAVAC™ control or relay transformer, a separate load relay package is required. Wire the control for the relay in parallel with the pump. The outside air blower must have a separate 20A, 120V power supply. See Page 38, Figure 21 for outside air blower internal wiring requirements.

### 10.2 Non-Pressurized

For a non-pressurized outside air supply, a 4" (O.D.) single wall pipe duct may be attached to the burner and end vent. For length and duct sizing requirements, see duct design rules in Figure 19. To prevent condensation, insulate the outside air duct.

## FIGURE 19: Duct Sizing

### Outside Air System Design Requirements:

#### Blower Performance (90707501):

##### 112 Flow Units

One outside air blower is required per each EP-100 or EP-200 series pump and two outside air blowers may be required for each EP-300 series pump. Outside air blowers cannot be shared between two separate CRV-Series systems.

#### Duct Design Rules:

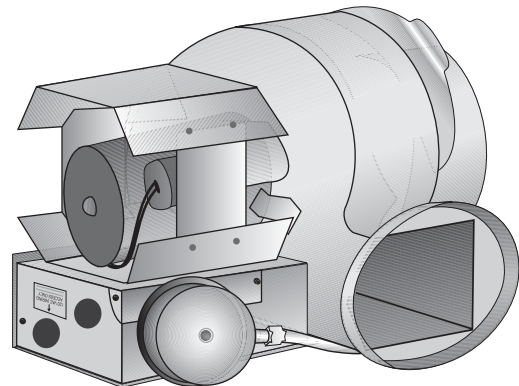
- System should be designed so that the blower is positioned closest to the highest flow requirements (end vents).
- When a duct is carrying more than 40 flow units, it must be at least 6" (15 cm) diameter.

#### Pressurized Systems

- 6" (15 cm) diameter duct must not exceed 120' (36 m) total per system.
- 4" (10 cm) diameter duct must not exceed 120' (36 m) per radiant branch.

#### Non Pressurized

- 6" (15 cm) diameter duct must not exceed 90' (27 m) maximum 100 flow units
- 4" (10 cm) diameter duct must not exceed 90' (27 m)
- Elbows are equivalent to 10' (3 m) of duct length.

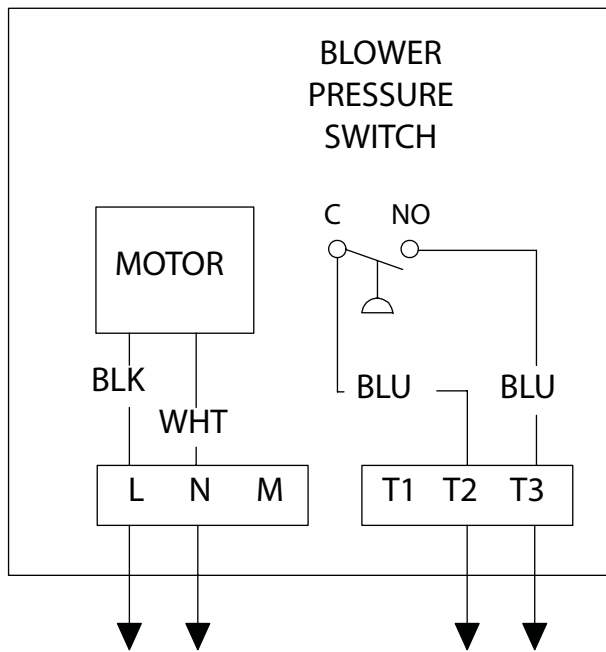


### 10.3 Outside Air Blower Internal Wiring

**FIGURE 20: Outside Air Blower Internal Wiring Diagram**

Outside air blower is shipped with the blower manufacturer's standard internal wiring. For use with Roberts-Gordon heaters, the outside air blower must be rewired with existing wires by the electrical contractor. See diagram.

Internal 24 V transformer provided will not be used and can be discarded.



**FIGURE 21: Filter Housing Assembly**

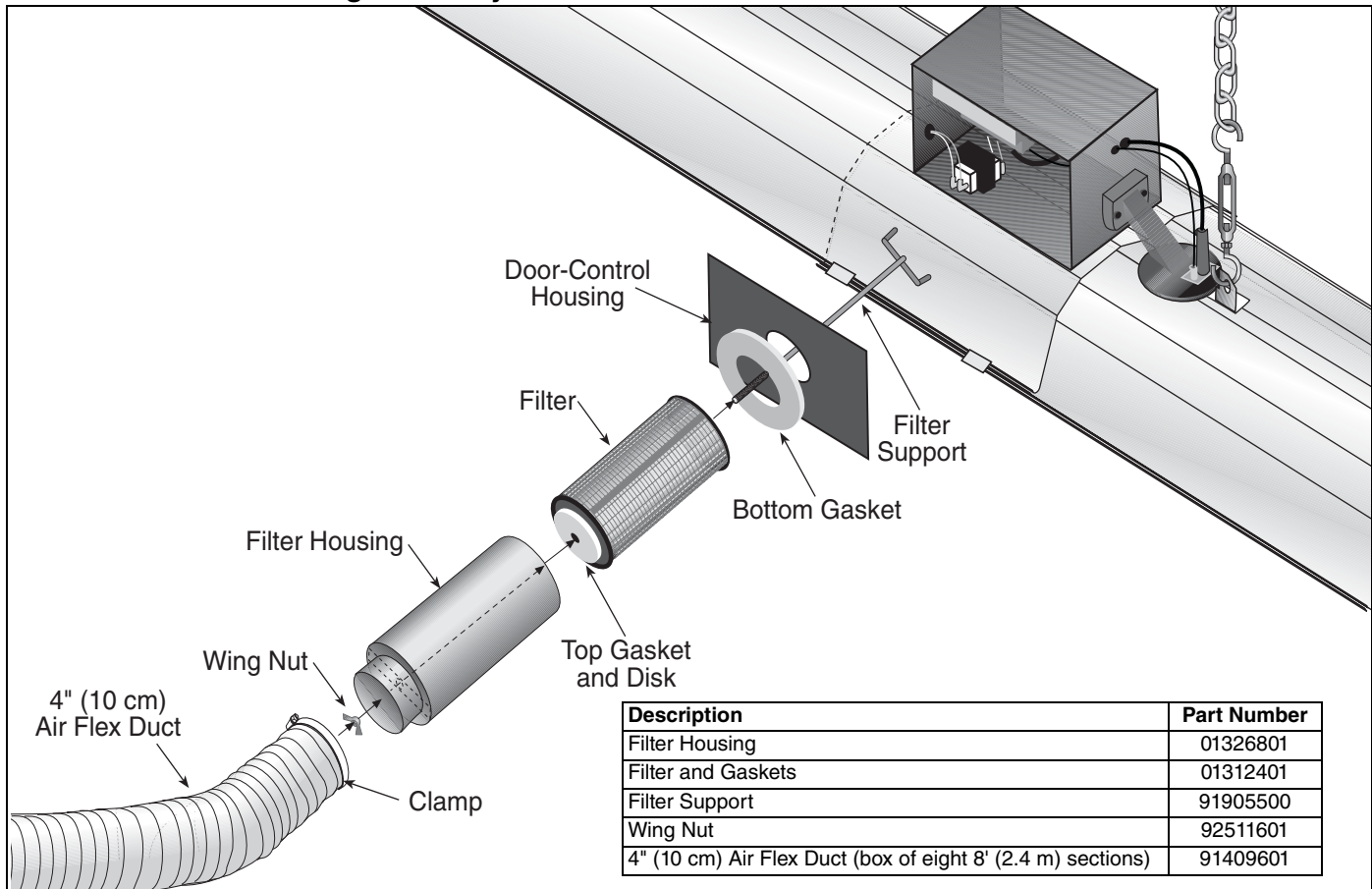


FIGURE 22: Air Supply Blower Support

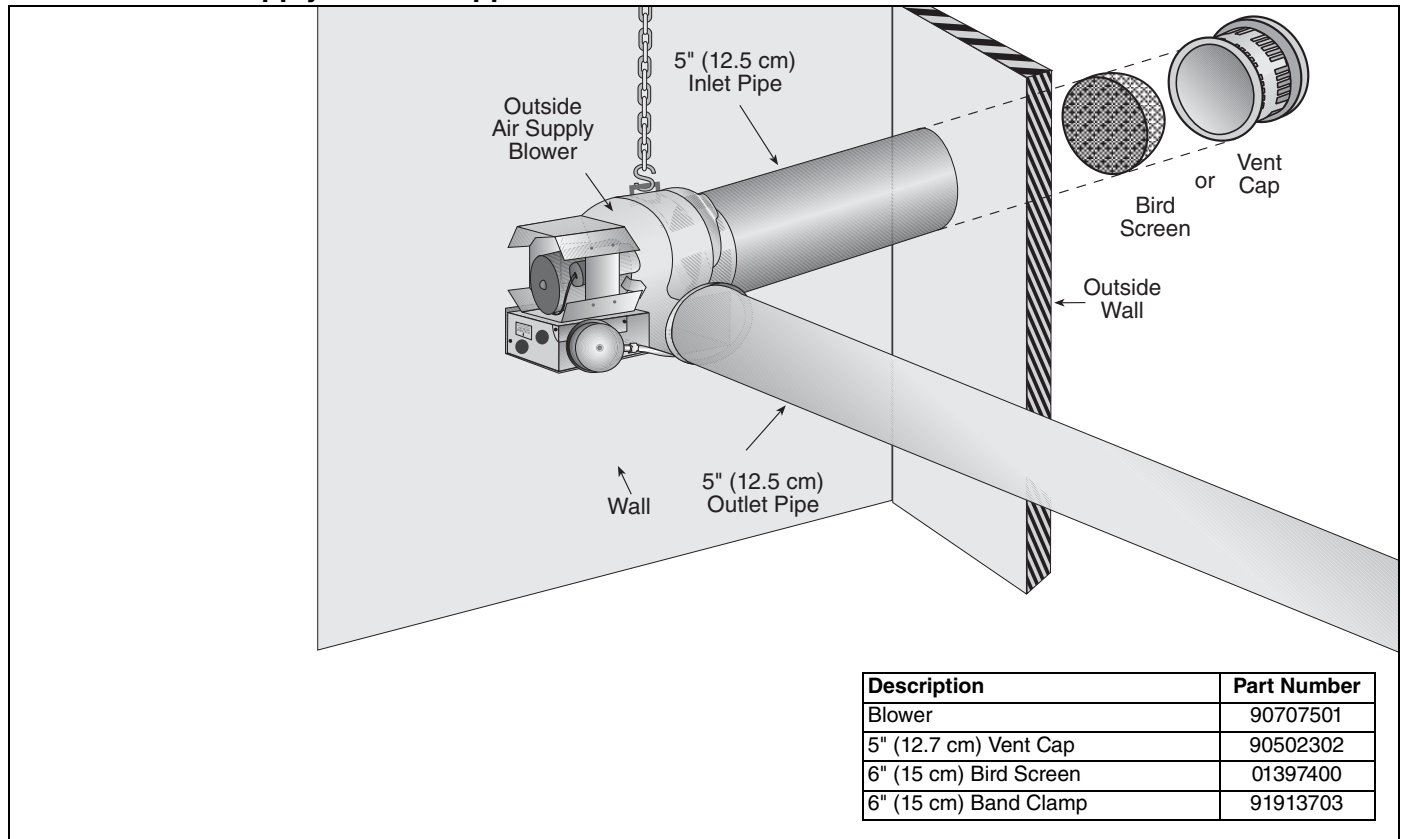
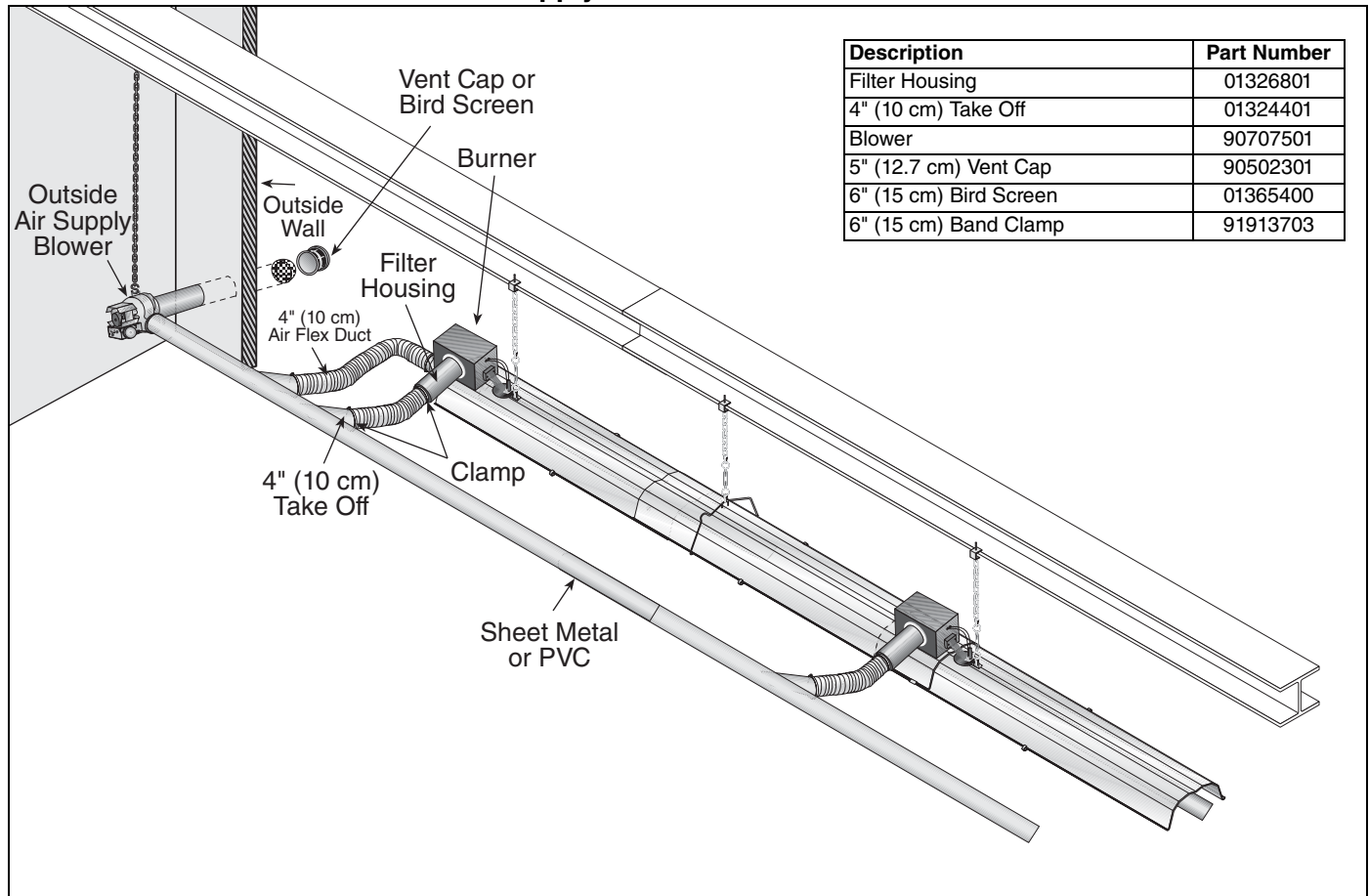
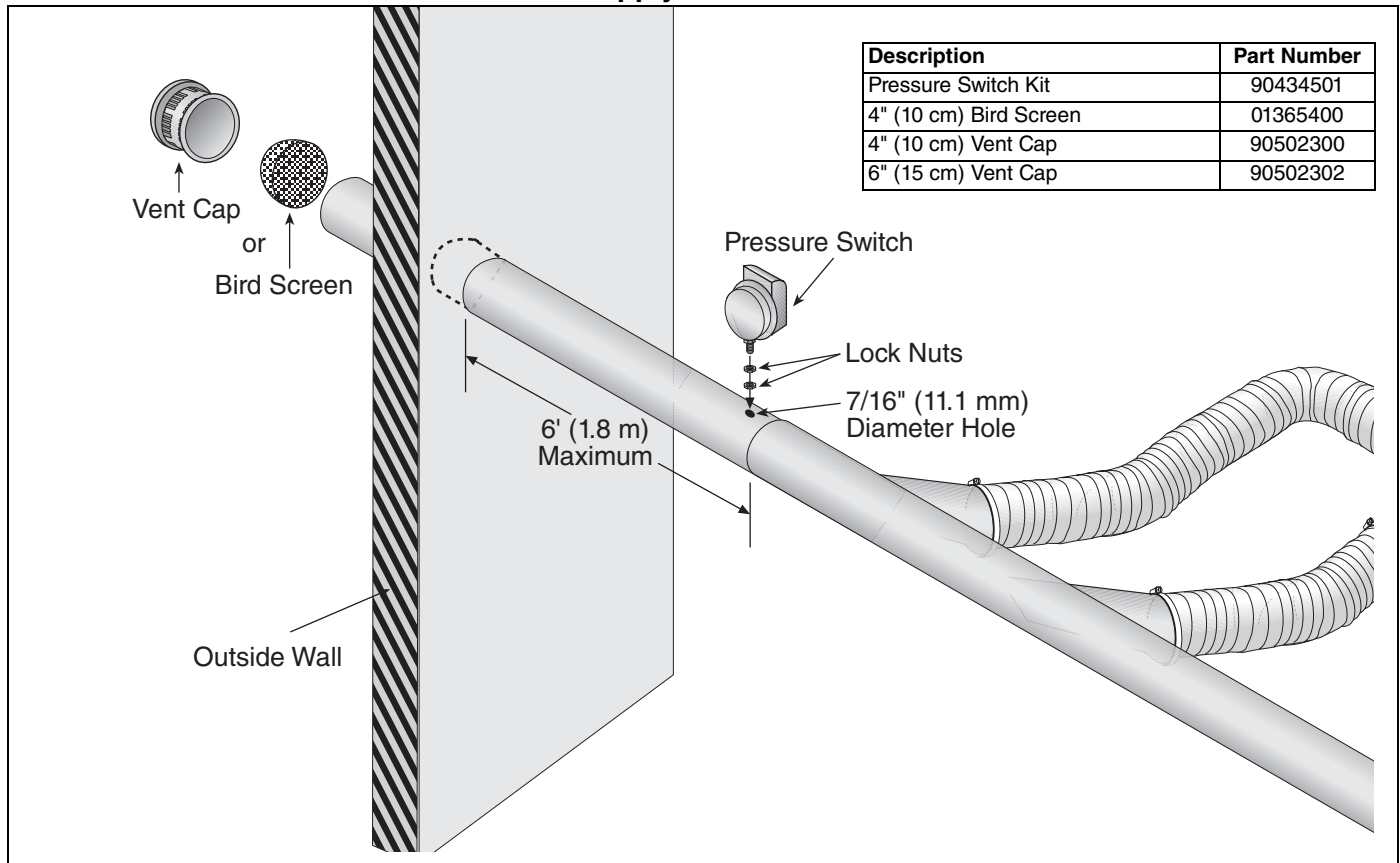


FIGURE 23: Pressurized Outside Air Supply




**FIGURE 24: Non-Pressurized Outside Air Supply**



## SECTION 11: GAS PIPING

**⚠ WARNING**



**Fire Hazard**

**Tighten gas hose fittings to connect gas supply according to Figure 25.**

**Gas hose can crack when twisted.**

**Gas hose moves during normal operation.**

**Failure to follow these instructions can result in death, injury or property damage.**

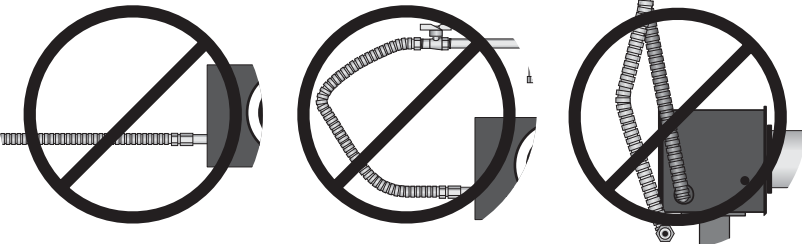
Install the gas hose as shown in *Figure 25*. The gas hose accommodates expansion of the heating system and allows for easy installation and service of the burner. Before connecting the burners to the supply system, verify that all high pressure testing of the gas piping has been completed.

There is an expansion of the tube with each firing cycle. This will cause the burner to move with respect to the gas hose. This can cause a gas leak resulting in an unsafe condition if the gas connection is not made in strict accordance with *Figure 25*.

Meter and service must be large enough to handle all the burners being installed plus any other connected load. The gas hose which feeds the system must be large enough to supply the required gas with a maximum pressure drop of 1/2" w.c. When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

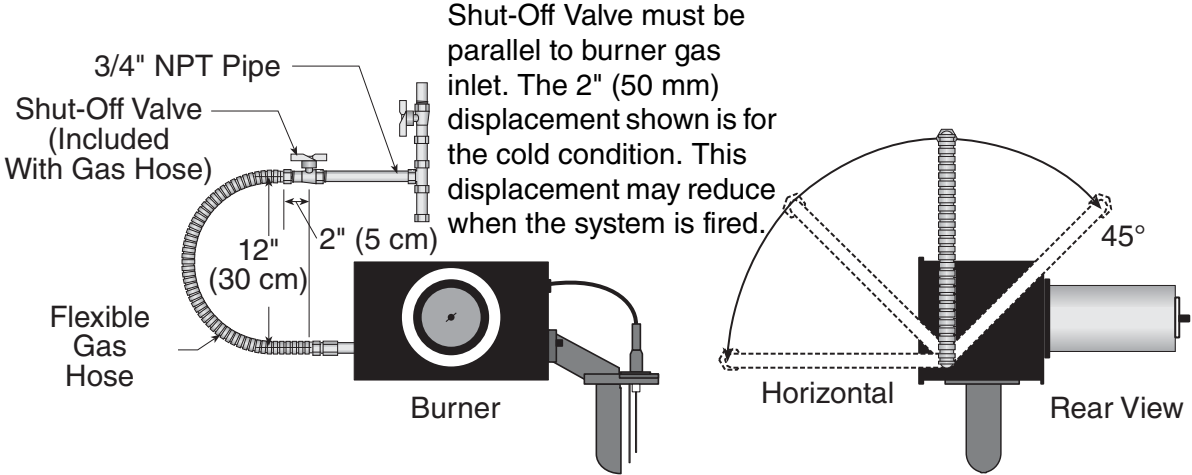
- **Do not high pressure test the gas piping with the burner connected. Failure to follow these instructions can result in property damage.**
- **Check the pipe and tubing ends for leaks before placing heating equipment into service. When checking for gas leaks, use a soap and water solution; never use an open flame.**

**FIGURE 25: Gas Connection with Flexible Gas Hose**



Hold gas nipple securely with pipe wrench when attaching the gas hose. Failure to follow these instructions can result in product damage.


Shut-Off Valve must be parallel to burner gas inlet. The 2" (50 mm) displacement shown is for the cold condition. This displacement may reduce when the system is fired.



Horizontal Rear View

Description	Part Number
1/2" Flexible Stainless Steel Gas Hose (US Models)	91412200
3/4" Flexible Stainless Steel Gas Hose (US Models)	91412203
1/2" Rubber (Type 1) Gas Hose (Canadian Models)	91412206
3/4" Rubber (Type 1) Gas Hose (Canadian Models)	91412207

## SECTION 12: CONTROL METHODS

<b>⚠ WARNING</b>

<b>Electrical Shock Hazard</b>
<p><b>Disconnect electrical power and gas supply before servicing.</b></p> <p><b>This appliance must be connected to a properly grounded electrical source.</b></p> <p><b>Failure to follow these instructions can result in death or electrical shock.</b></p>

There are several methods of controlling CRV-Series systems. The options are as follows:

**12.1 ROBERTS GORDON® System Control**

The System Control is an electronic control panel designed to control CRV-Series heating systems. The System Control wiring is shown *on Page 46, Figure 29 through Page 47, Figure 32* and in the System Control Installation Manual (P/N 10091601NA). The System Control can be used to control an EP-100 or EP-201 pump from the control panel. Other pumps such as the EP-301 and 3 phase models may be controlled by a relay or motor starter. The System Control can control up to four zones of burners.

The electrical circuit is a 120V AC (20A) supply. The output for the thermostat is 12V DC. Do not use thermostats that draw power from the low voltage supply.

A System Control operated system has two minutes post purge pump operation to completely exhaust products of combustion from the system. A system control provides indication of power to the pump and the zones as well as indicating the status of the pressure switch with lights.

The System Control is UL listed in accordance with UL873 – Temperature Indicating and Regulating Equipment.

**12.2 ROBERTS GORDON® ULTRAVAC™**

The ROBERTS GORDON® ULTRAVAC™ is a micro processor based control package designed for modulating control of CRV-Series heaters based on outdoor temperatures. The controls offer full modulation between 60% and 100% of system maximum rated input.

This controller is capable of giving control outputs to one pump and three heating zones. The controller also features inputs which are used for indoor and outdoor signal condition monitoring.

System status and settings are viewed and altered from a PC (not supplied) running ROBERTS GORDON® ULTRAVAC™ Software.

ROBERTS GORDON® ULTRAVAC™ Software requires a PC (not supplied) running Windows® 95 or higher, with a Pentium® class processor and at least 64k of RAM.

**Special design requirements apply for CRV-Series systems using the ROBERTS GORDON® ULTRAVAC™ Controller.**

**12.3 SPST Transformer Relay (P/N 90417600)**

The transformer relay wiring diagram is shown *on Page 43, Figure 26*. The transformer relay can be used to control an EP-100 or EP-201 pump CORAYVAC® system. The single pole relay can only be used to control one zone of burners.

The electrical circuit is a 120V AC (20 A) supply. The transformer 24V AC output for the thermostat is rated at 40 V A. Thermostats used with the transformer must not exceed this power requirement. A transformer relay operated system will not give any post purge pump operation to completely exhaust products of combustion from the system or provide indication of operating conditions.

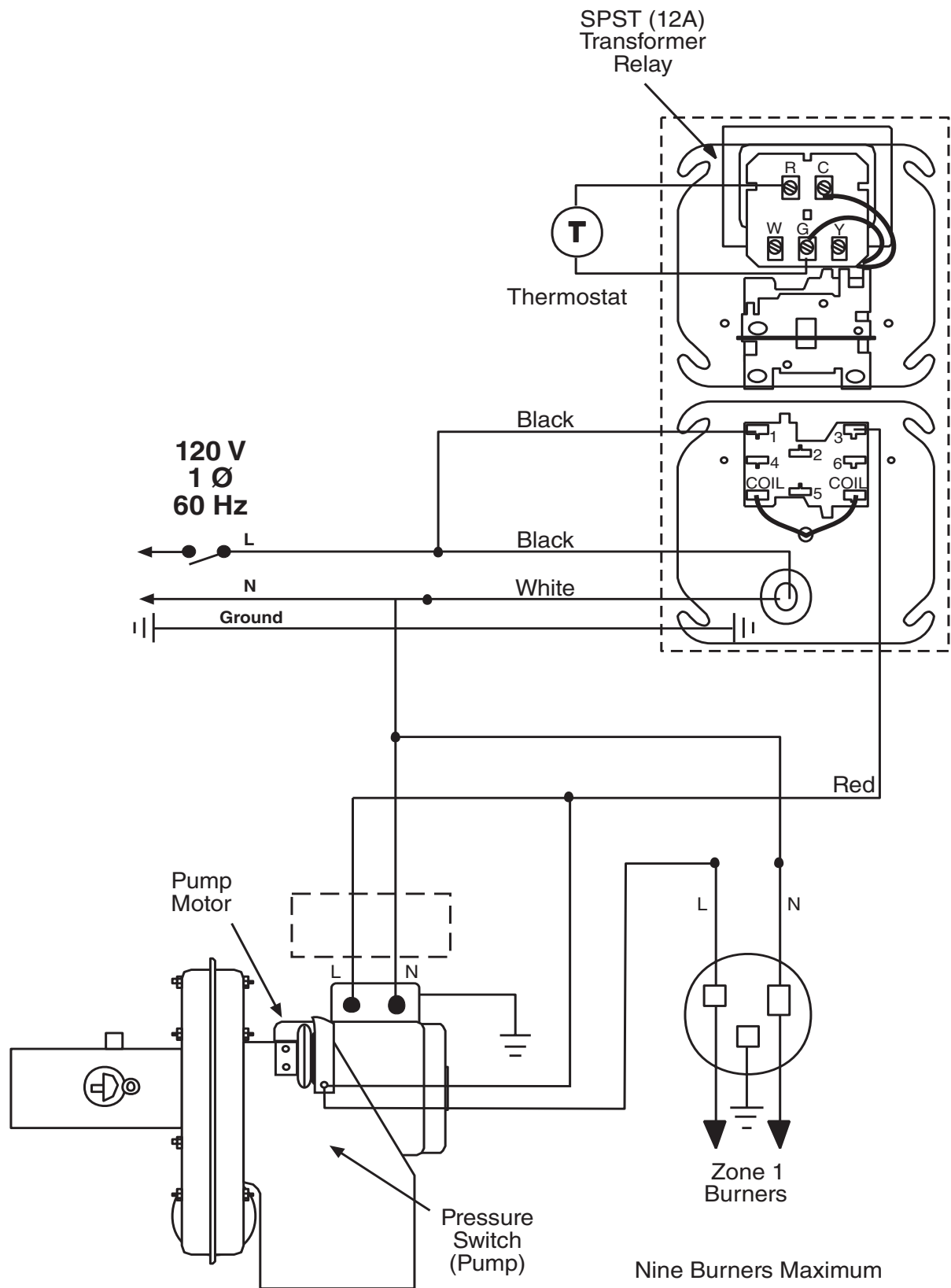
**12.4 DPST Transformer Relay (P/N 90436300)**

The transformer relay wiring diagram is shown *on Page 45, Figure 28*. The transformer relay can be used to control an EP-100 or EP-201 pump CORAYVAC® system. The double pole relay can only be used to control two zones of burners.

The electrical circuit is a 120V AC (20A) supply. The transformer 24V AC output for the thermostat is rated at 40VA. Thermostats used with the transformer must not exceed this power requirement. A transformer relay operated system will not give any post purge pump operation to completely exhaust products of combustion from the system or provide indication of operating conditions.

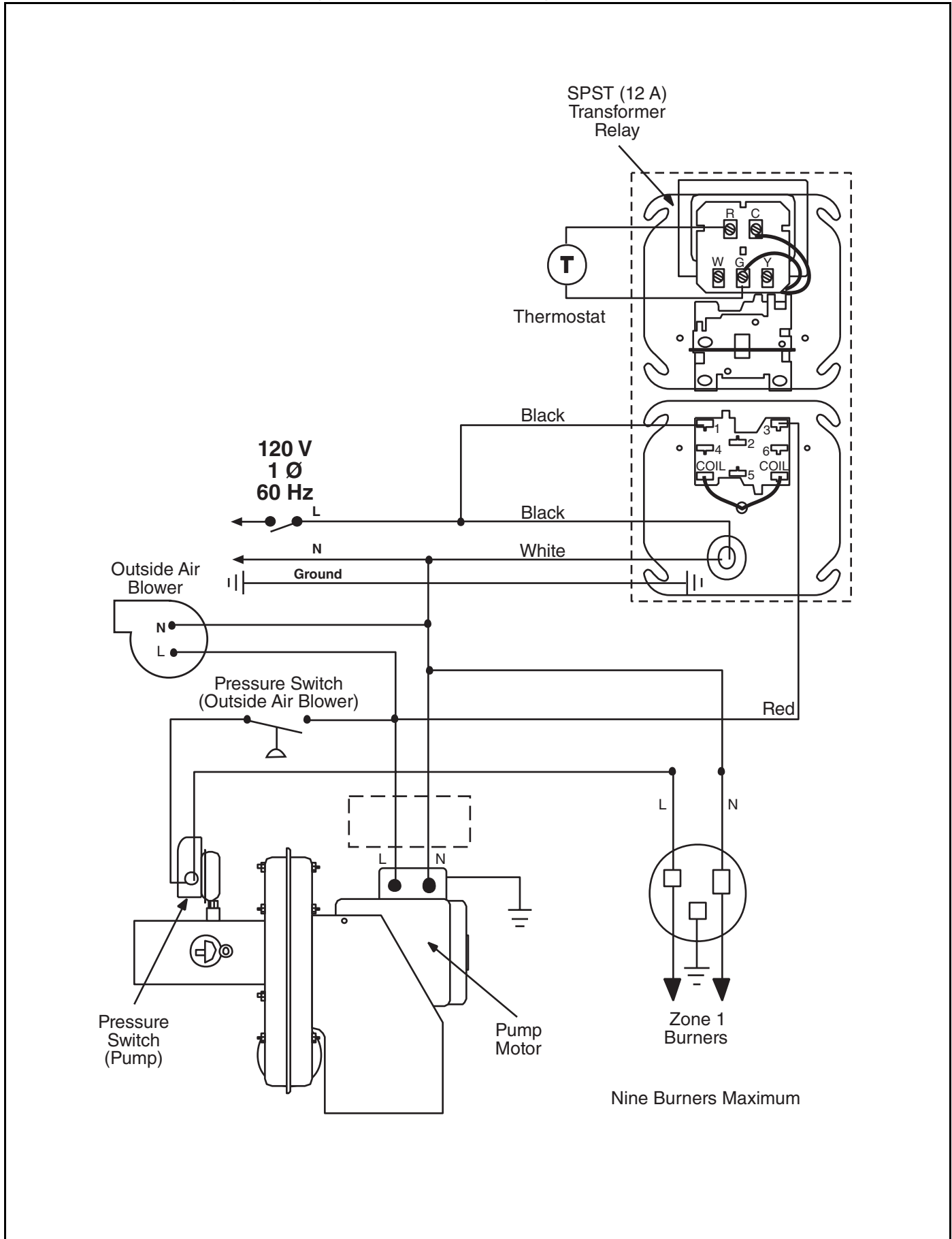


FIGURE 26: One Zone Operation without Control Panel

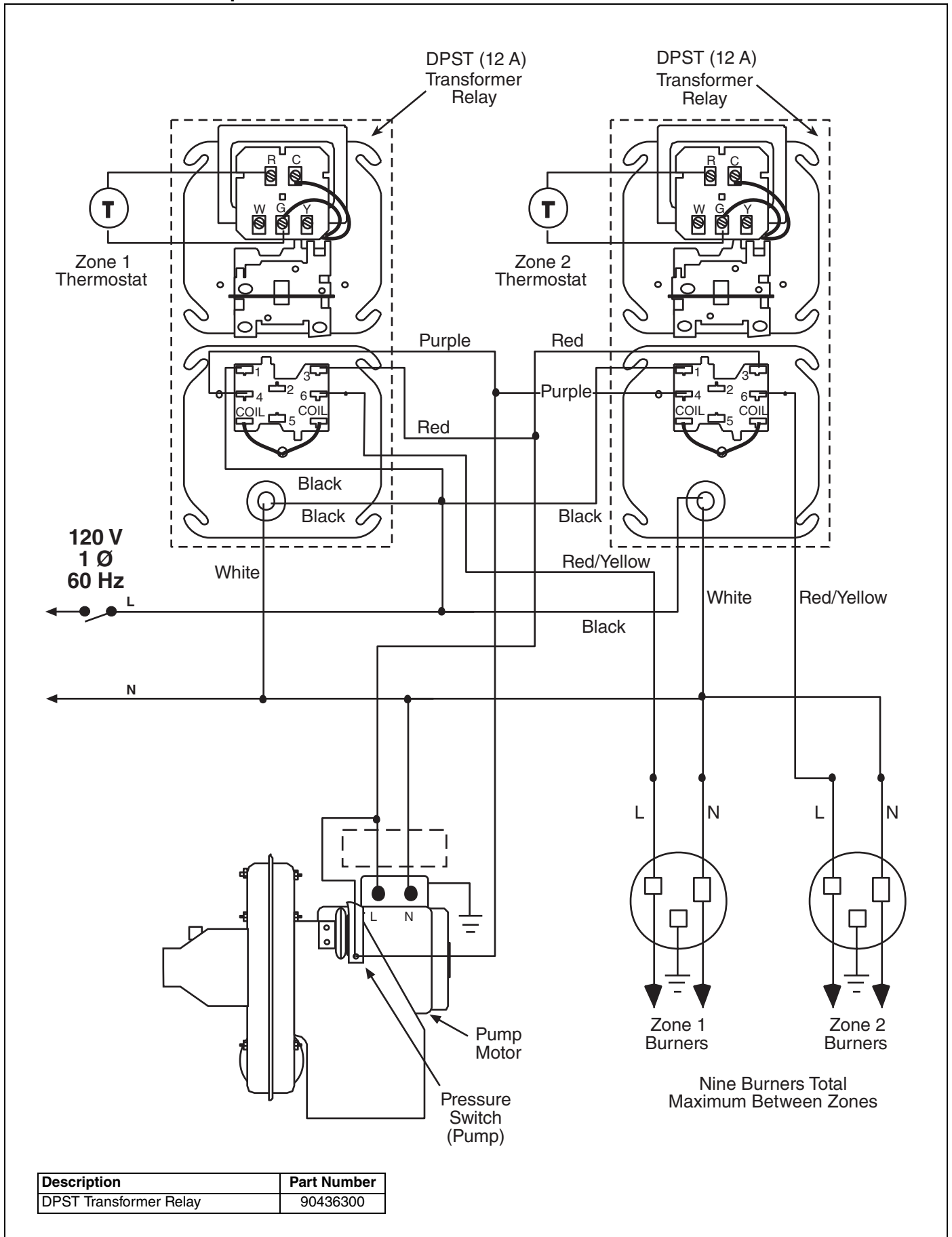


Description	Part Number
SPST Transformer Relay	90417600

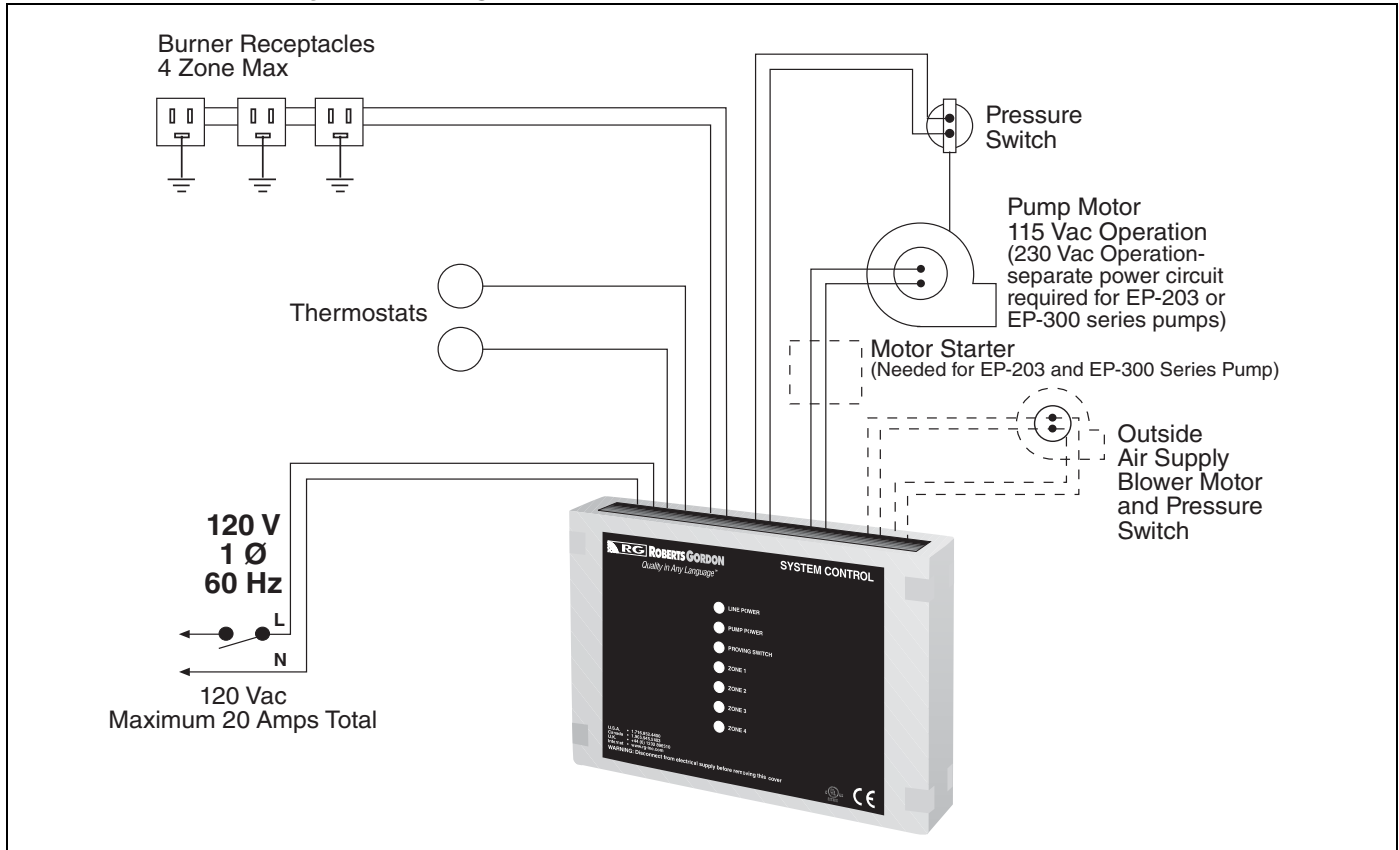
**FIGURE 27: One Zone Operation (with Outside Air Blower) without Control Panel**



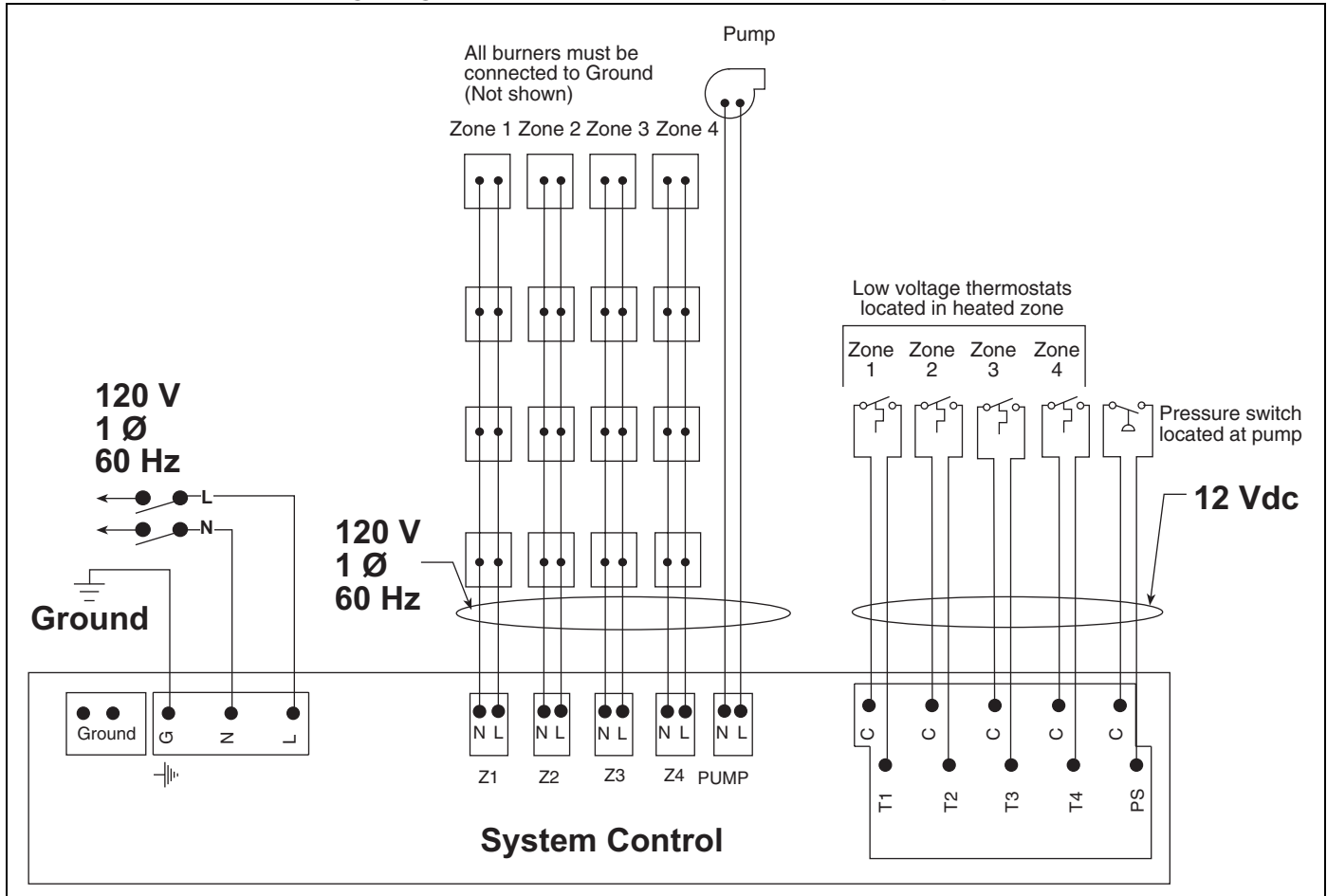
**FIGURE 28: Two Zone Operation without Control Panel**



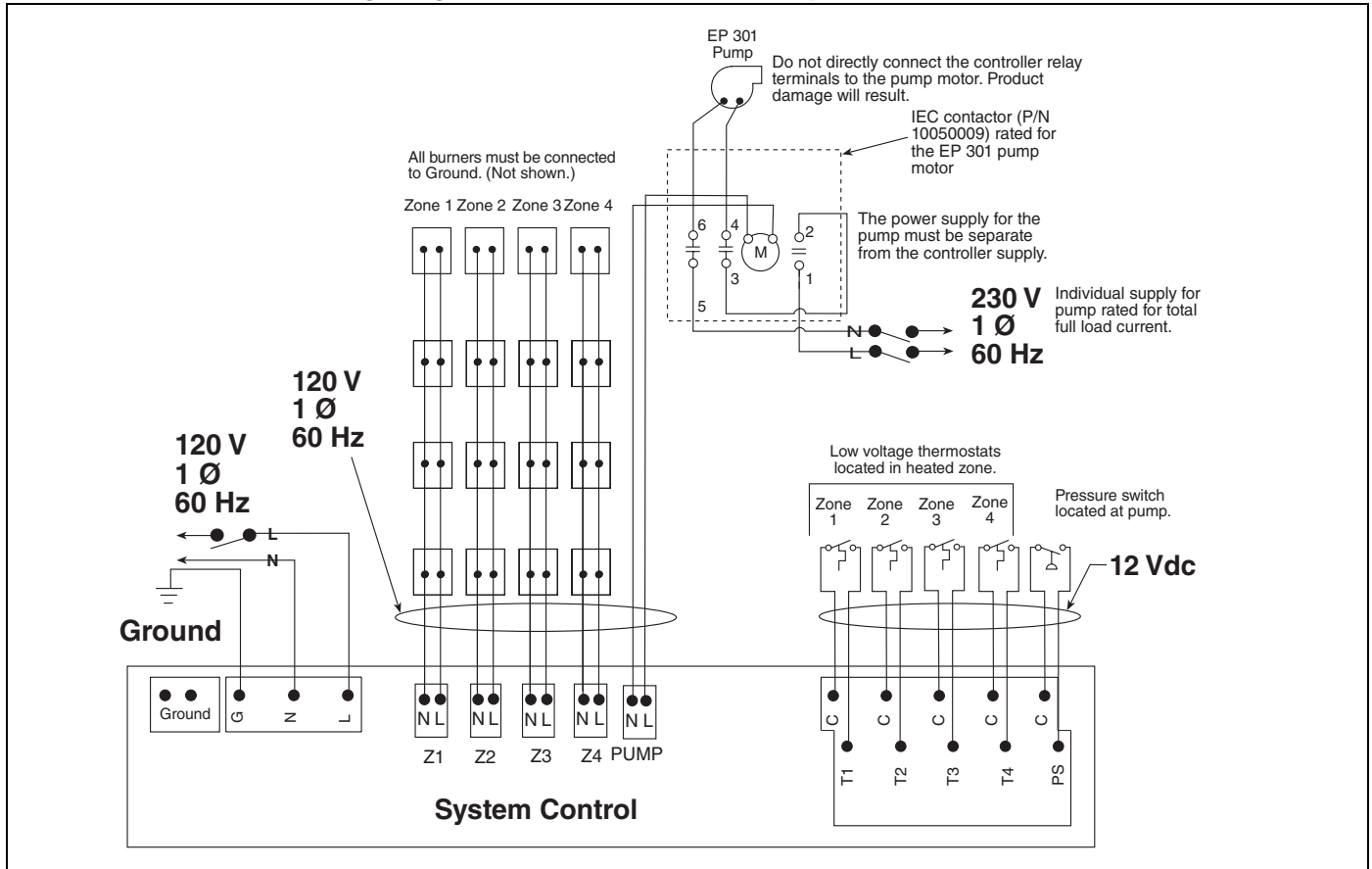
**FIGURE 29: General System Wiring**



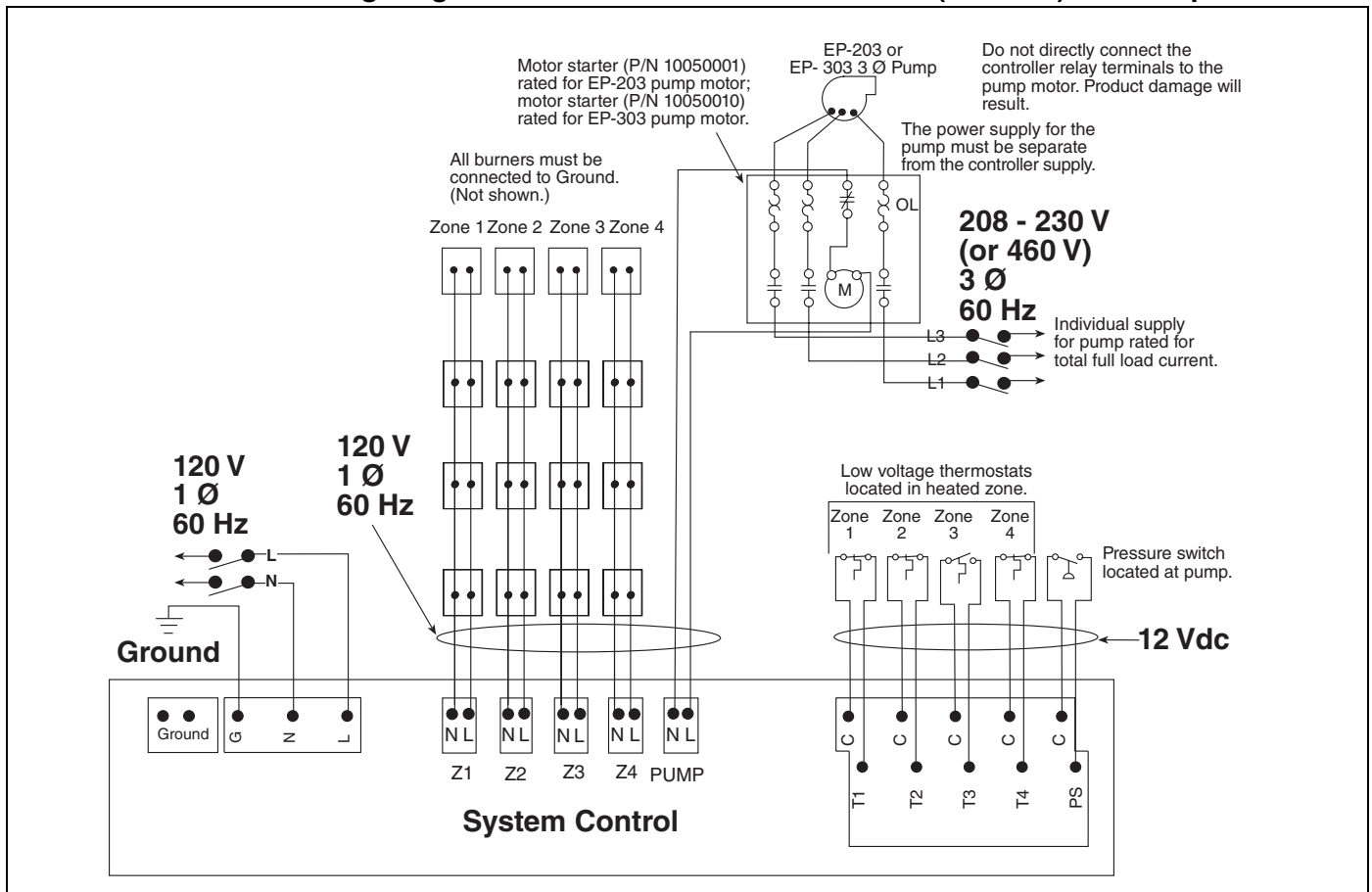
**FIGURE 30: External Wiring Diagram EP-100 and EP-201 120 V 1 Ø Pump**



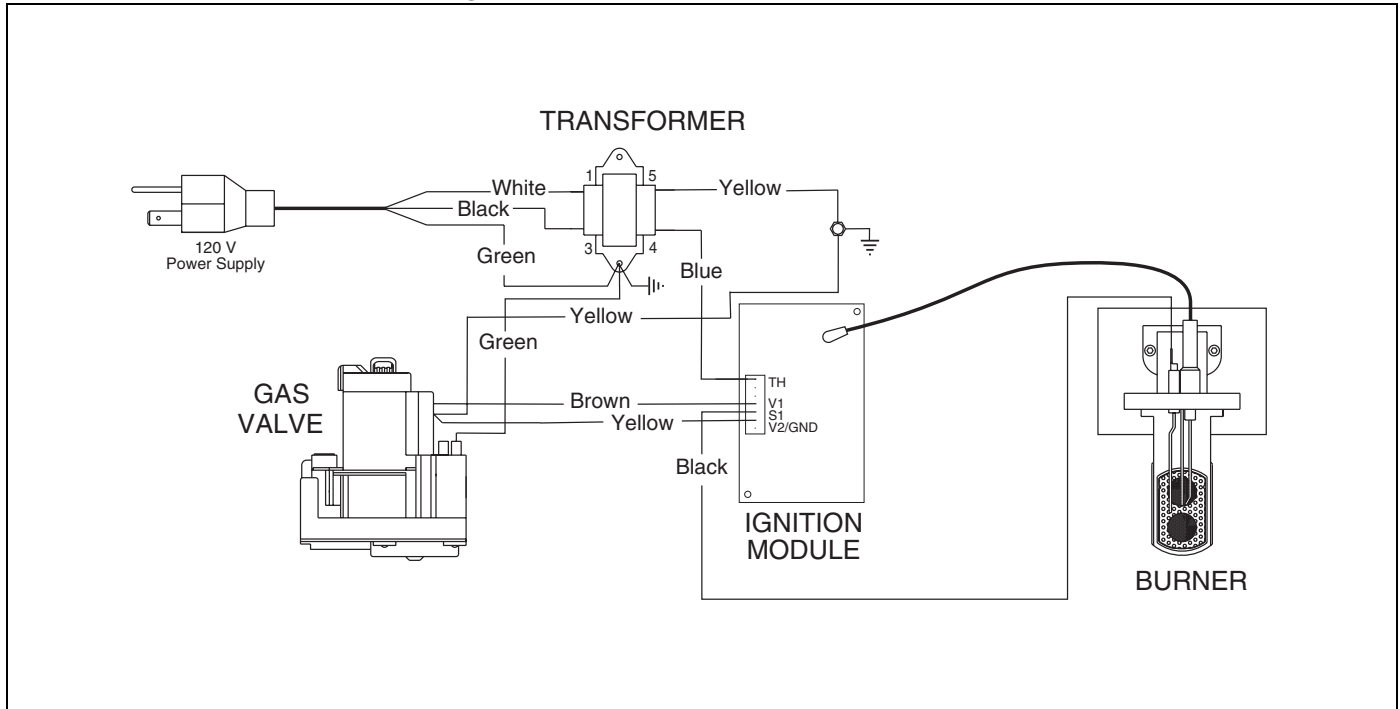
**FIGURE 31: External Wiring Diagram EP-301 120 V 1 Ø Pump**



**FIGURE 32: External Wiring Diagram EP-203 or EP-303 208 V - 230 V (or 460 V) 3 Ø Pump**

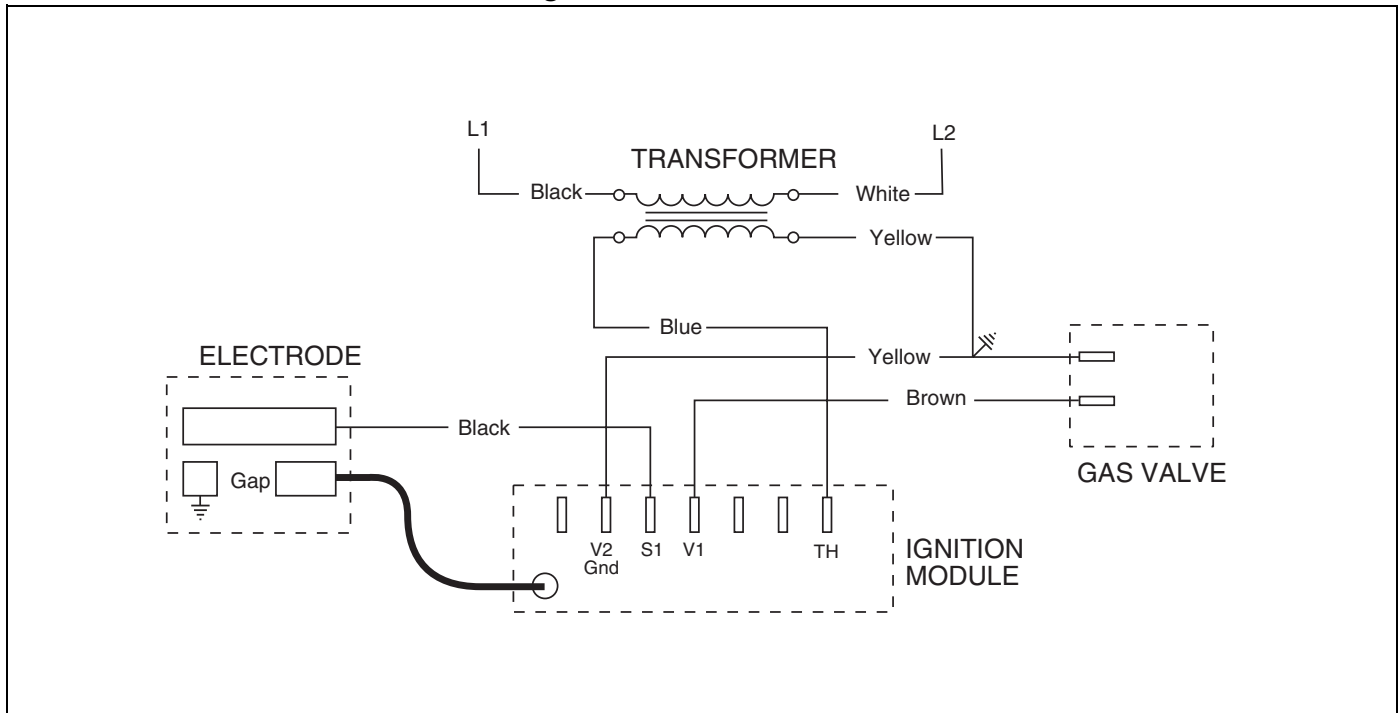


**FIGURE 33: Burner Internal Wiring**



**If any of the original wire as supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C and 600 volts.**

**FIGURE 34: Burner Internal Ladder Diagram**



## SECTION 13: STARTING THE SYSTEM

Start with the main gas valve closed and the electric power off.

### 13.1 Checking the Gas Line

1. Open the main valve and verify that no gas is flowing through the meter.
2. Purge the line if this was not done following pressure testing with air.
3. Verify that the gas pressure is not above 14" w.c. (1/2 PSIG).
4. Close the main gas valve.

### 13.2 Checking the Electrical System

1. See that all temperature setpoints are set below room temperature.
2. Turn on power supply to system controls.
3. Check to see that no part of the system (i.e. burners, pump or air supply blower) is powered.
4. Individually check each zone by raising the zone temperature set points separately. Raising each zone temperature set point above room temperature should start the pump immediately. After a 45 second delay, the burners will begin their ignition sequence by sparking at the electrode (visible through the burner window).
5. Make a preliminary vacuum check at burners in branches that have an adjustable damper coupling. See *Page 50, Figure 35* for manometer hookup to check vacuum. This check is to insure that all dampers are open before the system is fired. Vacuum, as measured at the end vents, should be approximately 3.5" w.c. or slightly above (cold).

### 13.3 Starting the System

**NOTE:** During the initial firing, the protective oil on the tubing may smoke for 30 to 60 minutes and adequate ventilation should be provided.

1. Start with all temperature setpoints below room temperature.
2. Open main gas valve.
3. Turn up temperature setpoints one zone at a time, waiting to see that all burners in a zone start. When the burner ignites, a blue flame will be observed through the viewer window.
4. If any abnormal operation occurs, see the troubleshooting section of the service instructions.

### 13.4 Setting the Vacuum

1. Set temperature setpoints above room temperature. See that all burners are operating properly.

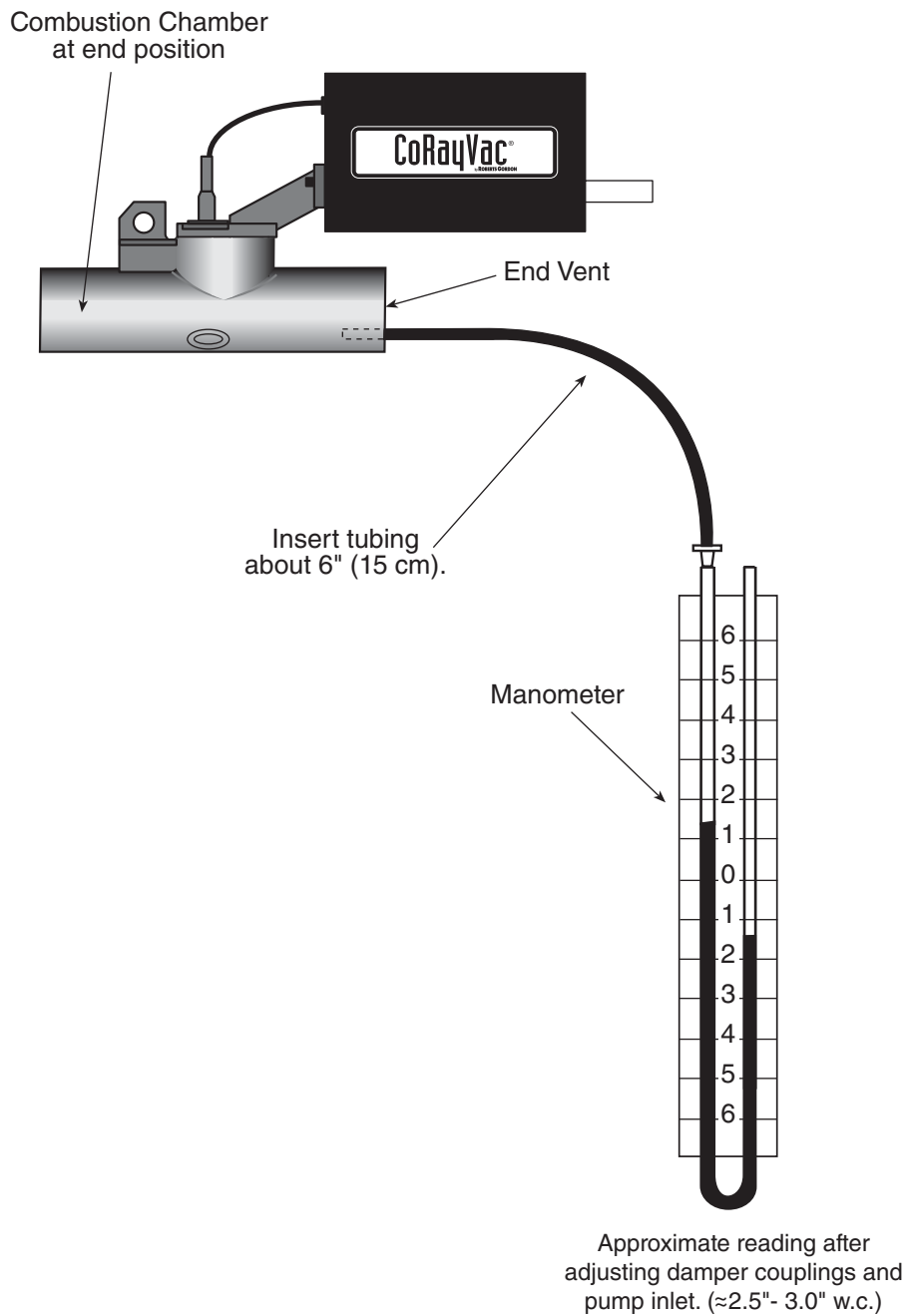
2. Allow at least ½ hour operation for temperature to normalize, then check system vacuum balance. Vacuum can be measured by inserting a manometer hose into the end vent as shown on *Page 50, Figure 35*. Normal end vent vacuum should be set at approximately 2.5" w.c. to 3.0" w.c. (hot).

Vacuum adjustments are made by means of the damper in the pump inlet and the adjustable damper coupling(s) in the system. Check the vacuum at all end vents and then adjust the damper coupling to obtain equal vacuum readings of 2.5" w.c. to 3.0" w.c. If end vent vacuum exceeds 3.0" w.c., adjust the pump inlet damper until vacuum readings are 2.5" w.c. to 3.0" w.c.

With systems designed to operate at maximum vacuum, it may not be possible to obtain vacuum differential readings at or slightly above 2.5" w.c. If so, adjust the damper couplings to maximum but equal vacuum reading. Be sure to lock all dampers securely after adjustment.

3. Reset temperature setpoints to desired room temperature.
4. If heat is not required, turn off main switch and close the main gas valve.

**FIGURE 35: Vacuum Reading**





## SECTION 14: OPERATION AND MAINTENANCE

The heater is equipped with a direct-spark ignition system.

### 14.1 Sequence of Operation

1. Turn the thermostat up. When the thermostat calls for heat, the pump will start immediately. After a short period, the burners will begin their ignition sequence. Sparking will begin at the electrodes and the gas valve will be energized 45 seconds later.
2. The flame will be sensed by the flame sensing rod and the electrode is de-energized.
3. If a flame is detected, the gas valve remains open. When the call for heat is satisfied, the burner shuts off. On CRV-Series systems equipped with the optional ROBERTS GORDON® System Control, or ROBERTS GORDON® ULTRAVAC™, the pump will continue operation for a post-purge period of two minutes.
4. If no flame is detected, the module will close and a purge period begins. If a flame is not established, a second purge and warm-up will take place and then a third trial cycle will begin. After three trials, the module will lockout for one hour or until reset.
5. A reset is accomplished by removing power from the module for at least 5 seconds (thermostat cycle is required) or automatically after 1 hour.



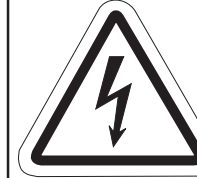
### 14.2 To Shut Off Heater

Set thermostat to lowest setting.  
Turn OFF electric power to heater.  
Turn OFF manual gas valve in the heater supply line.

### 14.3 To Start Heater

Turn gas valve and electric power OFF and wait five minutes for unburned gases to vent from heater.  
Turn ON main gas valve.  
Turn ON electric power.  
Set thermostat to desired temperature.  
Burner should light automatically.

### 14.4 Pre-Season Maintenance and Annual Inspection

<b>⚠ WARNING</b>		
		
<b>Explosion Hazard</b>		
<p><b>Service and annual inspection must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.</b></p>		
<p><b>Turn off gas and electrical supplies before performing service or maintenance.</b></p>		
<p><b>Failure to follow these instructions can result in death, injury or property damage.</b></p>		

To ensure your safety and years of trouble-free operation of the heating system, service and annual inspections must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Turn off gas and electric supplies before performing service or maintenance. Allow heater to cool before servicing.


Before every heating season, a contractor qualified in the installation and service of gas-fired heating equipment must perform a thorough safety inspection of the heater.

For best performance, the gas, electrical, thermostat connections, tubing, venting, suspensions and overall heater condition should be thoroughly inspected.

**NOTE:** Gas flow and burner ignition are among the first things that should be inspected.

Please see *Page 52, Section 14.5* for suggested items to inspect.

**14.5 Maintenance Checklist**

<b>! WARNING</b>		
		
<b>Explosion Hazard</b>		
<p><b>Service and annual inspection must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.</b></p> <p><b>Turn off gas and electrical supplies before performing service or maintenance.</b></p> <p><b>Failure to follow these instructions can result in death, injury or property damage.</b></p>		

**Installation Code and Annual Inspections:**

All installations and service of ROBERTS GORDON® products must be performed by a contractor qualified in the installation and service of products sold and supplied by Roberts-Gordon and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment. To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor annually inspect your ROBERTS GORDON® products and perform service where necessary, using only ROBERTS GORDON® replacement parts.

**The Vicinity of the Heater** Do not store or use flammable objects, liquids or vapors near the heating system. Immediately remove these items if they are present.  
*See Page 3, Section 3.*

**Vehicles and Other Objects** Maintain the clearances to combustibles.  
 Do not hang anything from, or place anything on, the heater.  
 Make sure nothing is lodged underneath the reflector, in between the tubes or in the decorative or protective grilles (included with select models).  
 Immediately remove objects in violation of the clearances to combustibles.  
*See Page 3, Section 3.*

**Reflector** Make sure there is no dirt, sagging, cracking or distortion.  
 Do not operate if there is sagging, cracking or distortion.  
 Make sure reflectors are correctly overlapped. *See Page 19, Figure 7.4.3.*  
 Clean outside surface with a damp cloth.

**Vent Pipe** Venting must be intact. Using a flashlight, look for obstructions, cracks on the pipe or gaps in the sealed areas or corrosion.  
 The area must be free of dirt and dust.  
 Remove any carbon deposits or scale using a wire brush.

**Outside Air Inlet** Inlet must be intact. Look for obstructions, cracks on the pipe or gaps in the sealed areas or corrosion.  
 The area must be free of dirt and dust. Clean and reinstall as required.

---

<b>Tubes</b>	<p>Make sure there are no cracks.</p> <p>Make sure tubes are connected and suspended securely.</p> <p>See Page 15, Figure 12 through Page 17, Section 7.2.1.</p> <p>Make sure there is no dirt, sagging, bending or distortion.</p> <p>Clean or replace as required.</p>
<b>Gas Line</b>	<p>Check for gas leaks. See Page 41, Figure 25.</p>
<b>Combustion Chamber Window</b>	<p>Make sure it is clean and free of cracks or holes.</p> <p>Clean or replace as required.</p>
<b>Blower Scroll, Wheel and Motor</b>	<p>Compressed air or a vacuum cleaner may be used to clean dust and dirt.</p>
<b>Burner Head and Orifice</b>	<p>Make sure it is clear of obstructions. (Even spider webs will cause problems). Carefully remove any dust and debris from the burner.</p>
<b>Electrode</b>	<p>Replace if there are cracked ceramics, excessive carbon residue, or erosion of the electrode.</p> <p>The electrode gap should be 1/8" (3 mm).</p>
<b>Thermostat or Sensor</b>	<p>There should be no exposed wire or damage to the thermostat or sensor.</p>
<b>Suspension Points</b>	<p>Make sure the heater is hanging securely. Look for signs of wear on the chain or ceiling.</p> <p>See Page 15, Figure 12.</p>
<b>Decorative and Protective Grille (optional)</b>	<p>The grille must be securely attached.</p> <p>Check that side reflector extensions are installed correctly and secured in place if necessary. (Decorative grille only.)</p> <p>See Page 25, Section 8.6.1 through Page 28, Section 8.7.5</p> <p>Make sure shield is installed correctly and secured in place if necessary. (Decorative grille only.) See Page 25, Section 8.6.2.</p>

---

## Pump

With pump operating, check for excessive vibration or noise. Vibration is usually a sign that the impeller is out of balance. Turn off the system, insure power is shut off and remove the inlet plate. Check the shaft seal and replace it if worn or missing.

### **With the Power off:**

Check the inlet and outlet of the pump for blockage or excessive soot and clean as necessary.

Check boots for cracking or deterioration and replace if necessary.

If a condensate trap is installed, check the condition of the trap and the drain line attached. Note: the condensate trap should be filled with water at the beginning of each heating season.

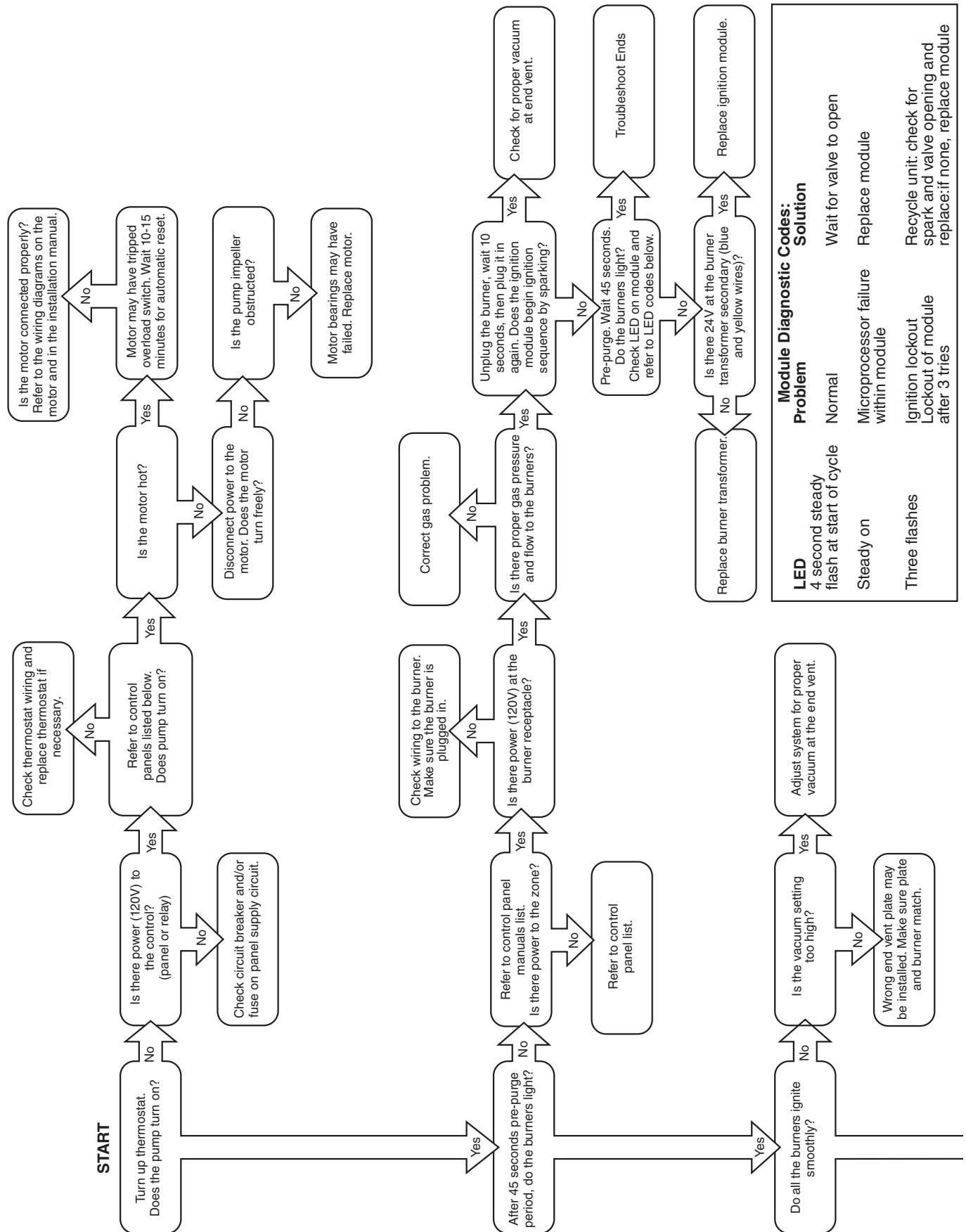
Check the condition of the motor mounts. Lift the motor from the rear; look for breaks in the rubber and replace if necessary.

Check the condition and operation of the pressure switch.

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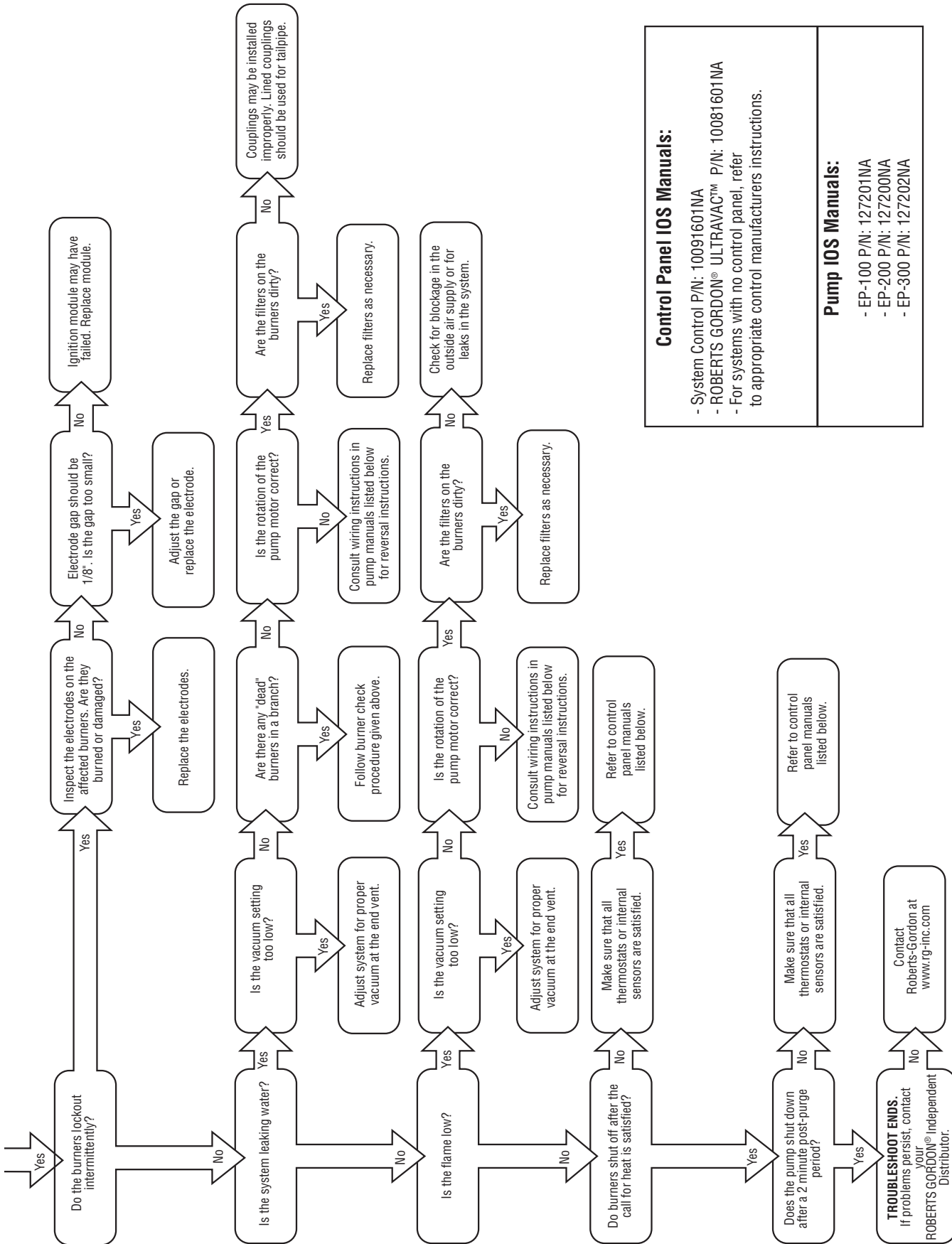
# SECTION 15: TROUBLESHOOTING

## 15.1 Troubleshooting Flow Chart



Module Diagnostic Codes:	
LED	Problem Solution
4 second steady flash at start of cycle	Normal Wait for valve to open
Steady on	Microprocessor failure within module Replace module
Three flashes	Ignition lockout Lockout of module after 3 tries Recycle unit: check for spark and valve opening and replace:if none, replace module

# Troubleshooting Flow Chart



**Control Panel IOS Manuals:**

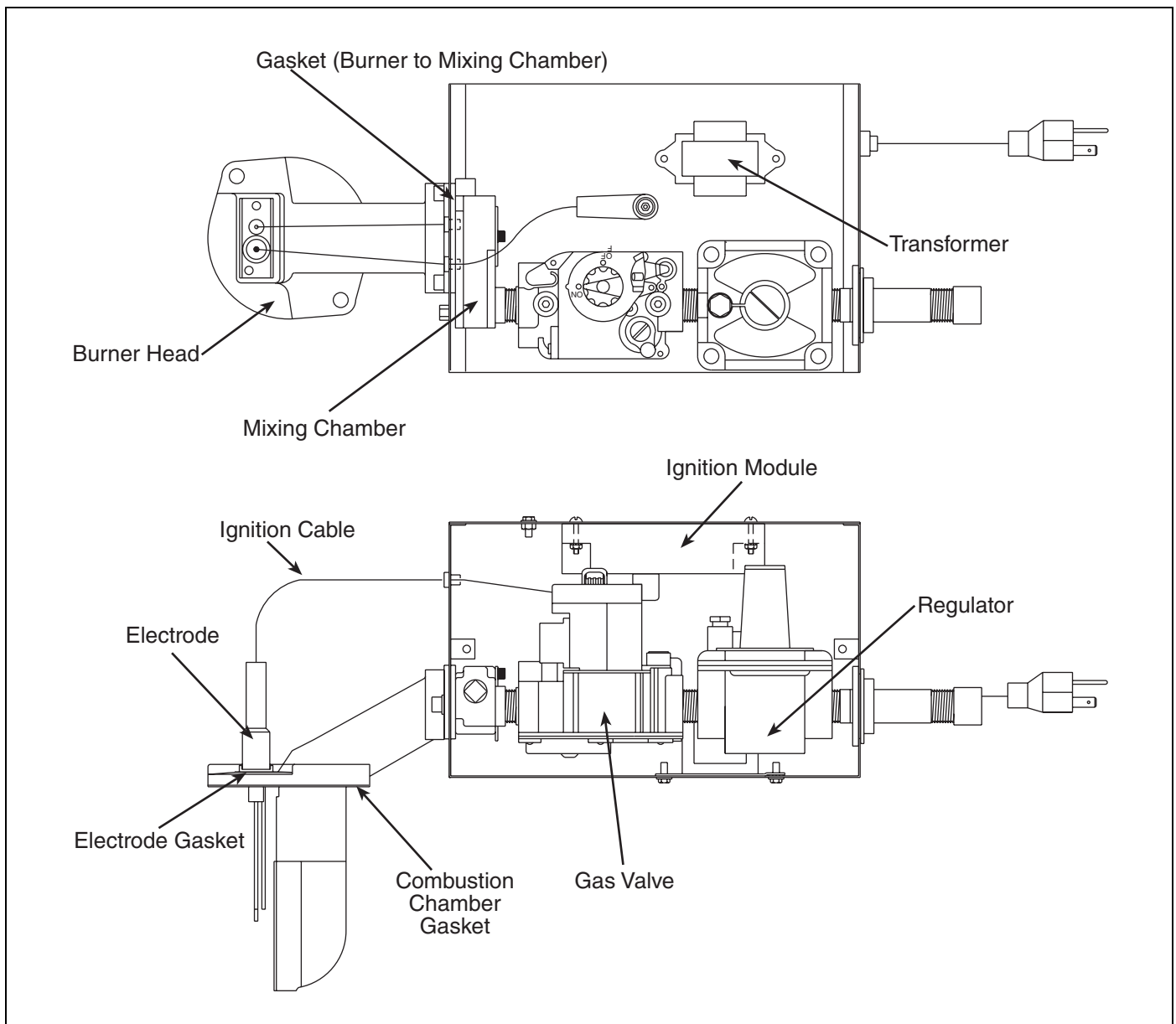
- System Control P/N: 10091601NA
- ROBERTS GORDON® ULTRAVAC™ P/N: 10081601NA
- For systems with no control panel, refer to appropriate control manufacturers instructions.

**Pump IOS Manuals:**

- EP-100 P/N: 127201NA
- EP-200 P/N: 127200NA
- EP-300 P/N: 127202NA

**SECTION 16: REPLACEMENT PARTS**

Use only genuine **ROBERTS GORDON®** replacement parts.  
 Use of parts not specified by Roberts-Gordon voids warranty.  
 Failure to follow these instructions can result in property damage.



Description	Part Number
Gas Valve (All Burners)	90032502
Gasket (Burner to Mixing Chamber)	01351100
Burner Head Assembly Replacement Package	02713000
Mixing Chamber	02790400
Transformer	90436900K
Regulator	90207100
Gasket (Combustion Chamber)	01367800
Electrode Replacement Kit (includes electrode, electrode gasket and mounting screws)	02713200
Ignition Module	90439500
Ignition Cable	90427706
Filter Cartridge with Gasket (not shown)	01312401

**SECTION 17: GENERAL SPECIFICATIONS**

**17.1 Material Specification**

**17.1.1 Reflectors**

.024 Aluminium (Optional - 024 Stainless Steel Type 304).

**17.2 Heater Specifications**

**17.2.1 Ignition**

Fully Automatic, Three-Try, Direct Spark, Electronic Ignition Control, 100% Safety Shut-Off.

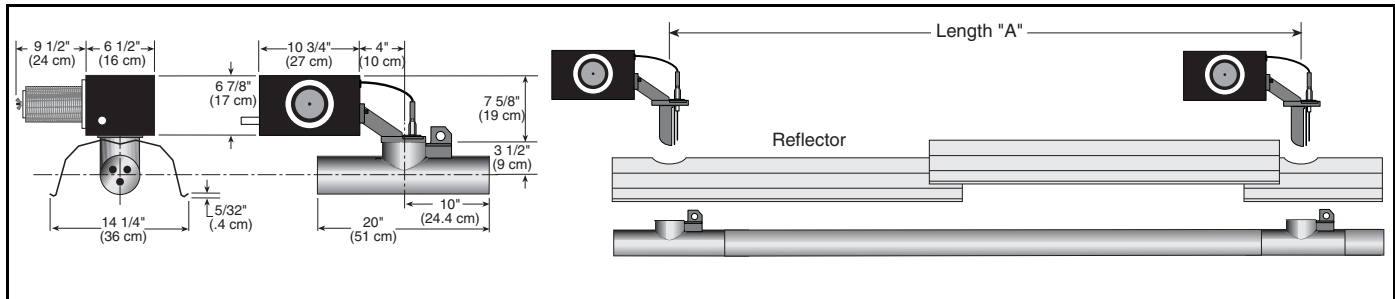
**17.3 Suspension Specifications**

Hang heater with materials with a minimum working load of 75 lbs (33 kg). See Page 15, Figure 12.

**17.4 Controls Specifications**

Time switches, thermostats, etc. can be wired into the electrical supply. External controls supplied as an option.

General Specifications for CRV-Series heaters are as follows:



Model	Heat Input Rate (Btu/h) x (1000)	Length "A"		Recommended Minimum Mounting Height* Spot Heating
		Minimum	Maximum	
CRV-B-2 (NG only)	20	10' (3 m)	20' (6.1 m)	8' (2.4 m)
CRV-B-4	40	12.5' (3.8 m)	25' (7.6 m)	8' (2.4 m)
CRV-B-6	60	20' (6.1 m)	35' (10.7 m)	8' (2.4 m)
CRV-B-8	80	20' (6.1 m)	45' (13.7 m)	10' (3 m)
CRV-B-9	90	25' (7.6 m)	50' (15.2 m)	10' (3 m)
CRV-B-10	100	30' (9.1 m)	60' (18.3 m)	15' (4.5 m)
CRV-B-12A (NG only)	110	35' (10.7 m)	70' (21.3 m)	15' (4.5 m)
CRV-B-12 (LP only)	120	35' (10.7 m)	70' (21.3 m)	15' (4.5 m)

\*See Page 3, Section 3 for clearances to combustibles.

**PIPE CONNECTION:**

1/2" NPT

**DIMENSIONS:**

Vent Connection Size: 4" (10 cm) or 6" (15 cm)

Outside Air Connection Size: 4" (10 cm)

Refer to figure above for dimensional information.

**GAS INLET PRESSURE:**

Natural Gas: 4.5" w.c. Minimum 14.0" w.c. Maximum

LP Gas: 10.5" w.c. Minimum 14.0" w.c. Maximum

**ELECTRICAL RATING:**

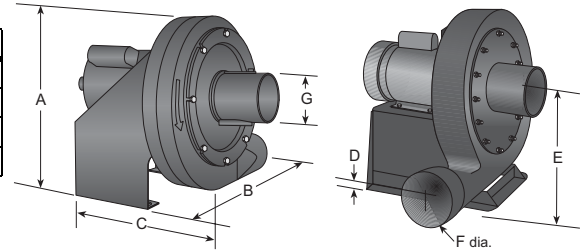
120 V - 60 Hz, 0.3 A



General Specifications for pumps are as follows:

**Pump Dimensional Data (in.)**

Model	A	B	C	D	E	F	G
EP-100	17	14.5	21	3.75	10	4	4
EP-201/203	17.75	17	20.25	3.25	10	4.5	4.5
EP-301/303	25.6	24.8	22.7	4.8	15.2	6	6



### Pump Specifications

Model	EP-100	EP-201	EP-203	EP-301	EP-303
Horsepower (Hp)	1/3	3/4	3/4	2*	2*
Phase (Ø)	1	1	3	1	3
Hertz (Hz)	60	60	60	60	60
Voltage (V)	115/230	115/230	208-230/460	208-230	208-230/460
Full Load Amp (Amps)	4.8/2.4	6.6/3.3	2.4-2.2/1.1	12.8-11.5	5.5-5.2/2.6
R.P.M.	3450	3450	3500	3450	3450
Motor Frame	56	56	56	90	90
Motor Enclosure	TENV	TENV	TEFC	TEFC	TEFC
Noise Level @ 5' (DBA)	-	70	70	-	-
Inlet/Outlet (In.)	4/4	4/4	4/4	6/6	6/6
Weight (lbs.)	62	112	112	170	170

\* For starter, see National Electric Code (NEC) requirement for motors 1 hp or higher.

### Air Supply Blower Specifications

Capacity	240 CFM @ 0.75 in wc
Power (W)	167
Phase	1
Hertz (Hz)	60
Voltage (V)	120
Full Load Amp (Amps)	1.5
R.P.M.	3000
Motor Enclosure	OPEN FC
Inlet/Outlet (In.)	5/5
Weight (lbs.)	10



**SECTION 18: THE ROBERTS GORDON® CORAYVAC® LIMITED WARRANTY****ROBERTS-GORDON WILL PAY FOR:**

Within 42 months from date of shipment from Roberts-Gordon, replacement parts will be provided free of charge for any part of the product which fails due to a manufacturing or material defect.

Roberts-Gordon will require the part in question to be returned to the factory. Roberts-Gordon will, at its sole discretion, repair or replace after determining the nature of the defect and disposition of part in question.

ROBERTS GORDON® warrants the cast iron combustion chamber of the CORAYVAC® Classic System will be free from defects in material and workmanship. This warranty is limited to twenty-five (25) years from the date of shipment by Roberts-Gordon. All other components of the CORAYVAC® Classic System adhere to the standard warranty listed in the paragraph above.

ROBERTS GORDON® Replacement Parts are warranted for a period of 18 months from date of shipment from Roberts-Gordon or the remaining CORAYVAC® warranty.

**ROBERTS-GORDON WILL NOT PAY FOR:**

Service trips, service calls and labor charges.

Shipment of replacement parts.

Claims where the total price of the goods have not been paid.

Damage due to:

- Improper installation, operation or maintenance.
- Misuse, abuse, neglect, or modification of the CORAYVAC® in any way.
- Use of the CORAYVAC® for other than its intended purpose.
- Incorrect gas or electrical supply, accident, fire, floods, acts of God, war, terrorism, or other casualty.
- Improper service, use of replacement parts or accessories not specified by Roberts-Gordon.
- Failure to install or maintain the CORAYVAC® as directed in the Installation, Operation and Service Manual.
- Relocation of the CORAYVAC® after initial installation
- The use of the CORAYVAC® in a corrosive atmosphere containing contaminants.
- The use of the CORAYVAC® in the vicinity of a combustible or explosive material.
- Any defect in the CORAYVAC® arising from a drawing, design, or specification supplied by or on behalf of the consumer.
- Damage incurred during shipment. Claim must be filed with carrier.

**WARRANTY IS VOID IF:**

The CORAYVAC® is not installed by a contractor qualified in the installation and service of gas fired heating equipment.

You cannot prove original purchase date and required annual maintenance history.

The data plate and/or serial number are removed, defaced, modified or altered in any way.

The ownership of the CORAYVAC® is moved or transferred. This warranty is nontransferable.

Roberts-Gordon is not permitted to inspect the damaged controller and/or component parts.

**READ YOUR INSTALLATION, OPERATION AND SERVICE MANUAL**

If you have questions about your controller, contact your installing professional. Should you need Replacement Parts or have additional questions, call or write Roberts-Gordon:

**U.S.A.**

1250 William Street  
P.O. Box 44  
Buffalo, New York 14240-0044  
716.852.4400

On the web at: [www.rg-inc.com](http://www.rg-inc.com)

**Roberts-Gordon's liability, and your exclusive remedy, under this warranty or any implied warranty (including the implied warranties of merchantability and fitness for a particular purpose) is limited to providing replacement parts during the term of this warranty.**

Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you. There are no rights, warranties or conditions, expressed or implied, statutory or otherwise, other than those contained in this warranty.

**Roberts-Gordon shall in no event be responsible for incidental or consequential damages or incur liability for damages in excess of the amount paid by you for the CORAYVAC®.** Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

Roberts-Gordon shall not be responsible for failure to perform under the terms of this warranty if caused by circumstances out of its control, including but not limited to war, fire, flood, strike, government or court orders, acts of God, terrorism, unavailability of supplies, parts or power. No person is authorized to assume for Roberts-Gordon any other warranty, obligation or liability.

**LIMITATIONS ON AUTHORITY OF REPRESENTATIVES:**

No representative of Roberts-Gordon, other than an Executive Officer, has authority to change or extend these provisions. Changes or extensions shall be binding only if confirmed in writing by Roberts-Gordon's duly authorized Executive Officer.



## OWNER WARRANTY REGISTRATION CARD

**Mail or Fax to:**

Roberts Gordon, LLC • 1250 William Street, P.O. Box 44 • Buffalo, NY 14240-0044 • Phone: 716-852-4400 • Fax: 716-852-0854  
Toll Free: 800-828-7450 • www.rg-inc.com

**About the Owner:**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

**About the Installer:**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

**Purchased From (if different than installer):**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

**About your Heater:**

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_ Fuel: \_\_\_\_\_ Installation Date: \_\_\_\_\_

**Type of Installation (check one):**

- |  |  |                                    |                                       |                                      |
|--|--|------------------------------------|---------------------------------------|--------------------------------------|
| <input type="checkbox"/> Automotive      | <input type="checkbox"/> Manufacturing | <input type="checkbox"/> Warehouse | <input type="checkbox"/> Recreational | <input type="checkbox"/> Aircraft    |
| <input type="checkbox"/> Public Building | <input type="checkbox"/> Office        | <input type="checkbox"/> Retail    | <input type="checkbox"/> Agricultural | <input type="checkbox"/> Other _____ |
- 

**Installation Code and Annual Inspections:** All installations and service of ROBERTS GORDON® products must be performed by a contractor qualified in the installation and service of products sold and supplied by Roberts-Gordon and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment.

To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor annually inspect your ROBERTS GORDON® products and perform service where necessary, using only ROBERTS GORDON® replacement parts.

**This product is not for residential use.**

This product is intended to assist licensed professionals in the exercise of their professional judgement.

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Attach this information to a wall near the ROBERTS GORDON® heater.

# **ROBERTS GORDON®** Infrared Heating

Read the Installation, Operation, and Service Manual thoroughly before installation, operation, or service.

Know your model number and installed configuration.

Model number and installed configuration are found on the burner and in the Installation, Operation and Service Manual.

Write the largest clearance dimensions with permanent ink according to your model number and configuration in the open spaces below.

## OPERATING INSTRUCTIONS

1. STOP! Read all safety instructions on this information sheet.
2. Open the manual gas valve in the heater supply line.
3. Turn on electric power to the heater.
4. Set the thermostat to desired setting.

## TO TURN OFF THE HEATER

1. Set the thermostat to off or the lowest setting.

## IF THE HEATER WILL NOT OPERATE, TO ENSURE YOUR SAFETY, FOLLOW THESE INSTRUCTIONS TO SHUT DOWN YOUR HEATER

1. Set the thermostat to off or the lowest setting.
2. Turn off electric power to the heater.
3. Turn off the manual gas valve in the heater supply line.
4. Call your registered installer/contractor qualified in the installation and service of gas-fired heating equipment.

## ⚠ WARNING



### Fire Hazard

Some objects can catch fire or explode when placed close to heater.

Keep all flammable objects, liquids and vapors the required clearances to combustibles away from heater.

Failure to follow these instructions can result in death, injury or property damage.

**Maintain \_\_\_\_\_ clearance  
to the side and  
\_\_\_\_\_ clearance below  
the heater from vehicles  
and combustible materials.**

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#### Installation Code and Annual Inspections:

All installations and service of ROBERTS GORDON® products must be performed by a contractor qualified in the installation and service of products sold and supplied by Roberts-Gordon and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment. To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor annually inspect your ROBERTS GORDON® products and perform service where necessary, using only ROBERTS GORDON® replacement parts.

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